Message

From: Vergeront, Julie [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=99966bfa656f4d7c85b4b370f8b33c0e-Vergeront, Julie]
Sent: 4/10/2017 11:52:28 PM
To: Davies, Lynne [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=169eb6cbdebb4caf85f76390b8ab2674-LDavie12]
CC: Valdez, Heather [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=eb323347294d44009a369c3576798bdf-Valdez, Heather]; Pavitt, John [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=31d144be2f8043a2b6de245e1706134a-Pavitt, John]
Subject: FW: Region 10 Request for Assistance: Chem Waste Organic Recovery Unit/ RCRA Part 264 Subpart CC Applicability
Attachments: SA 22 Draft Clean Highlighted.docx

Attorney Client / Deliberative Process / Ex. 5

Julie A. Vergeront
Assistant Regional Counsel
EPA Region 10
1200 Sixth Avenue, Suite 900
Seattle, WA 98101
206-553-1497
vergeront.julie@epa.gov

From: Davies, Lynne
Sent: Monday, April 10, 2017 3:48 PM
To: Mia, Marcia <Mia.Marcia@epa.gov>; Welles, Laura <Welles.Laura@epa.gov>; Martin, Thomas <martin.thomas@epa.gov>
Cc: McArthur, Lisa <McArthur.Lisa@epa.gov>; Knittel, Janette <Knittel.Janette@epa.gov>; Valdez, Heather <Valdez.Heather@epa.gov>; Vergeront, Julie <Vergeront.Julie@epa.gov>; Pavitt, John <Pavitt.John@epa.gov>
Subject: Region 10 Request for Assistance: Chem Waste Organic Recovery Unit/ RCRA Part 264 Subpart CC Applicability

Hi Marcia, Laura, and Tom -

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We've attached the Standalone #22 document for your review, and I will send another email with some links to background documents collected by Heather that might be helpful, including RCRA online notices.

Many thanks for your help! Please let me know if you'd like to discuss anything, and I can schedule a call with our Region 10 folks.

Lynne

Lynne Davies
Attorney-Advisor
U.S. Environmental Protection Agency, Region 10
1200 Sixth Avenue, Suite 900, ORC -113
Seattle, WA 98101
(206) 553-5556

State of Oregon
Department of Environmental Quality

Organic Recovery Unit #2
Design and Operations Plan

For

Chemical Waste Management of the Northwest, Inc.

Arlington Facility • ORD 089 452 353
17629 Cedar Springs Lane
Arlington, Oregon

Standalone Document No. 22

This document is issued by the
Oregon Department of Environmental Quality

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| - ORGANIC RECOVERY UNIT #2

1.1 Introduction

This *Organic Recovery Unit #2 Design and Operations Plan* (Plan) establishes the design and operating standards for the Bioremediation and the Organic Recovery Unit (ORU) treatment processes.

1.2 Purpose

- To ensure compliance with all aspects of Organic waste treatment under 40 CFR §264 subparts AA,BB, and CC air emissions standards and;,
- To ensure treatment standards are achieved for all treated wastes per 40 CFR §268.40.

1.1.1 Organic Recovery Unit ORU-2

CWMNW operates two Organic Recovery Units (ORU), designated ORU-1 and ORU-2. Both ORU treatment systems are located adjacent to Containment Building B-5. ORU-1 received approval to operate in 2010 and has been operating since that time. ORU-1 is covered under *Standalone #19 – Bioremediation and Organic Recovery Unit Design and Operations Plan*.

ORU-2 was constructed and commissioned in 2016, The ORU-2 treatment unit treats listed and/or characteristic hazardous wastes using an indirect fired thermal process to reduce listed and/or characteristic hazardous wastes to the levels specified in 40 CFR Part 268. Secondary treatment methods may be required to reduce the treated listed and/or characteristic hazardous wastes to the levels specified in 40 CFR Part 268 prior to land disposal. Wastes accepted for treatment through the ORU-2 treatment system are staged inside Building B-5 and in approved containers in outside storage areas. Post-treatment solids awaiting LDR clearance or further treatment are temporarily stored in piles inside Building B-4 or B-5.

1.3 ORU-2 Treatment System

ORU-2 material handling conveyers receive material from two feed hoppers and convey the media to be treated to the ORU treatment unit. System feed conveyors are fully enclosed and ventilated to the thermal oxidizer. The ORU-2 system consists of a double pass rotary furnace that indirectly heats the media traveling through the inside of the rotary tube, and the treated media discharges at the feed end of the unit. System components subject to freezing are heat traced and insulated to prevent freezing. As-built design plans for the ORU-2 are contained in Appendix A.

1.4 Wastes Approved for Treatment

ORU-2 physically treat media with organic contamination. The following table illustrates the general waste families and possible associated RCRA Codes being treated by the system.

Table 19-1: ORU Approved Waste Codes

APPROVED EPA CODES
D001, D002, DOO3, D004, D005, D006, D007, D008, D009, D010, D011, D012, D013, D014, D015, D016, D017, D018, D019, D020, D021, D022, D023, D024, D025, D026, D027, D028, D029, D030, D031, D032, D033, D034, D035, DO36, D037, D038, D039, D040, F001, F002, F003, F005, F034, F037, F038, K001, K048, K049, K050, K051, K052, K143, K169, K170, K171, K172, P037, P059, P089, U002, U019, U031, U036, U051, U052, U060, U061, U112, U129, U140, U154, U159, U161, U165, U188, U210, U220, U228, U239

The ORU Treatment systems are made up of several subsystems that include the feed systems, an indirect fired Anaerobic Thermal Desorption Unit (ATDU), ash handling systems, vapor condensing system, process water handling and treatment systems, and air emissions control systems. A process flow diagram for the various systems is contained in Appendix B.

1.5 Waste Segregation

The treatment of the wastes with codes in Table 19-1 through the ORU system may require the isolation of process residuals dependent on the EPA codes associated with the waste being treated. These incompatible wastes will be treated separately following a system change over. The system changeover process shall include the following tasks, all wastes in the feed system will be processed through the ATDU, all process water will be evacuated from the system and treated through the process water treatment system, and all sludges accumulated in the sludge removal system will be removed and stored in accordance with the WAP. Evacuated residual sludges and process waters will be treated and/or managed in accordance with the WAP.

- ORU-2 SYSTEM OVERVIEW

2.1 Anaerobic Thermal Desorption Unit

The system is designed to separate the organic constituents from contaminated media in such a manner that they are preserved for collection and recycling. The Anaerobic Thermal Desorption Unit (ATDU) includes a rotating cylinder that is slightly inclined downward from the product feed end. This rotating cylinder is enclosed within an outer shell, within which heat is applied to the outside of the rotating cylinder. Either Landfill Gas or Propane will be used to fire the ATDU. Wastes inside the ATDU do not directly contact the heat source, and an inert atmosphere is maintained in the cylinder to prevent oxidation of the organic constituents. The indirectly heated cylinder vaporizes water and organics contained in the waste. The primary heat transfer mechanism is conduction through the cylinder wall.

2.2 ATDU Operating Conditions

The ATDU rotating cylinder operates under an inert anaerobic atmosphere, thereby preventing any oxidation or destruction of the hydrocarbon or chemical constituents. The inert anaerobic atmosphere is maintained during start-up and shutdown by purging the ATDU with steam to displace the oxygen. During normal operations, the water content of the feedstock is typically sufficient to generate enough water vapor to maintain the inert atmosphere inside the desorber and additional steam is therefore not required. The seals at the inlet and discharge ends of the rotary drum combined with the double tipping valve airlocks at either end maintain a non-oxidizing atmosphere in which the waste can be safely vaporized.

An oxygen sensor connected to the SCADA control system is installed in the discharge end of the ATDU continuously monitors the oxygen concentration within the rotary drum which during normal operations is typically below 1 percent. The SCADA control system the oxygen sensor measures the oxygen concentration inside the drum, in the event the oxygen level increases above 1 percent, steam can be added to reduce the oxygen concentration down to normal levels. In the event the oxygen level rises above 5 percent this would constitute a malfunction condition, the SCADA system will automatically shut down the burners and stop feed into the ATDU.

2.3 ATDU Shutdown Strategy

The system is shutdown employing three scenarios; these are Normal. Malfunction, and Emergency scenarios. The following is a discussion for each scenario;

2.3.1 Emergency Shutdown

Emergency shutdowns are required for

- Feed to the ATDU system is shutdown, feed conveyor system are shutdown
- Burners shutdown
- ATDU shutdown.
- Thermal Oxidizer bypass valve set to open
- Thermal Oxidizer is shutdown

2.3.2 Normal Plant Shutdown

The normal shutdown procedure involves shutting down equipment from the feed end of the unit down through the discharge equipment, allowing adequate time for each conveyor or piece of equipment to fully discharge before proceeding to the next item. The rotary drum will be allowed to cool before drum rotation is stopped. During this cooldown period steam is added to ensure the anaerobic atmosphere inside the ATDU is maintained. After the unit has cooled the vapor recovery and ancillary support systems are shut down. Finally, the thermal oxidizer system is shutdown

2.3.3 Shutdown due to Malfunction

The ATDU system is programmed with both software and hardwired process interlocks to ensure components shut down automatically upon the failure or malfunction of any critical piece of process equipment. Failure of the system to maintain proper combustion in the furnace, process conditions in the ATDU or thermal oxidizer, or a failure of the material handling equipment downstream of the ATDU will cause the system to automatically switch off the combustion system, stop the feed of material into the unit. Should the malfunction involve the thermal oxidize, the system, will divert process vapors away from the thermal oxidizer until the upset condition can be remedied.

2.3.4 Emergency Plant Shutdown

Hardwired interlocks will initiate an emergency shutdown upon loss of primary electrical power, high oxygen concentration inside the ATDU or a runaway stack temperature in the ATDU furnace or Thermal Oxidizer Unit. Redundant gas safety valves installed on each burner spring fail closed if there is any loss in the numerous permissive conditions or interlocks that allow their opening. Feed to the plant is stopped automatically. In certain cases, the thermal oxidizer will remain running but should the emergency condition involve the thermal oxidizer, the system will divert process vapors away from the thermal oxidizer until the upset condition can be remedied. An uninterruptible power supply (UPS) supports the control system to allow the operator to monitor the system shutdown in the event of complete power loss.

2.4 Feed Systems

A below grade mixing hopper south of contaminant Building B5 receives untreated medias, moisture conditions them if necessary and feeds the waste through a series of conveyors to the ATDU for thermal separation. If desired this mixing hopper feed system can also pile the moisture conditioned media inside Building B-5 allowing for storage of the media inside the building. A second feed hopper inside the building is loaded by mechanical methods, the hopper feeds a debris screen which removes materials meeting the definition of debris contained in 40 CFR 268.45 from the waste. Oversize media separated by the screening system is classified as debris and is stored on the floor in containment Building B-5 for delivery to other treatment methods in accordance with Standalone #11 - *Debris Treatment Plan*. The undersize media is then fed through a series of conveyors to the ATDU for thermal separation. An arrangement of airlocks ensure that oxygen is not able to enter the unit during the process operation. The ORU Feed Systems are designed to maintain compliance with 40 CFR 61, Subpart FF (Benzene Waste Operations NESHAP, or BWON) control and treatment standards to manage BWON subject materials when required.

2.5 Treated Ash Systems

The ORU vaporizes organic contaminants contained in media and produces a treated ash that is cooled through jacketed cooling conveyors. A series of transfer conveyors route the processed solids to several separate discharge points in Building B-4, each discharge point will be used to create piles inside the containment building approximately 250 tons in size. Ash may also be stored in containment Building B-5 or in approved containers prior to disposal or further treatment. The ash from the treatment process can be landfilled once the waste meets LDR limits in 40 CFR 268.7. Ash that does not meet the constituent specific LDRs is further treated and cleared before disposal. Confirmation testing is completed in accordance with Standalone #1- *Waste Analysis Plan*.

2.6 Vapor Recovery System

The organic vapors and water are gasified inside the rotating cylinder, and conveyed to a condensing system. The condensing system uses process water to quench the organic vapors. Once quenched the resulting quench water is separated into an organic fraction and a water fraction. The organic fraction separated from the treated wastes can be generally classified in two categories;

2.6.1 Petroleum Fractions

The condensed and separated organic fraction for wastes with recoverable petroleum fraction is not regulated according to 40 CFR 261.6(a)(3)(iv)(C), and is transferred to one of three product storage tanks in the tank farm area. Organic fraction product for these wastes is recycled as a commodity depending on makeup.

2.6.2 Non-Petroleum Fractions

The condensed organic fraction for wastes without recoverable petroleum fractions is subject to the disposal requirements contained in 40 CFR 268 and are managed in accordance with *Standalone #1 – Waste Analysis Plan*. The condensed organic fraction is transferred as process water to the water treatment system in the tank farm area.

2.7 Settled Solids

Settled solids which accumulate in the vapor recovery sump are conveyed out of the sump into a closed hopper. These accumulated solids may be reintroduced back into the ORU feed system for treatment using pumps or mechanical means. In some cases, a centrifuge may be used to dewater these solids for shipment offsite for additional treatment. Liquids separated in the centrifuging process are introduced back into the process water for reuse and/or final treatment.

2.8 Process Water System

Reclaimed commodities are separated from the process water fraction in the oil water separator. Process water is recycled back into the system, and any residual water condensed out of the incoming waste is stored in the process water tank. Residual process water is transferred to surge tanks in the tank farm area. Process water is treated through an onsite water treatment system in the tank farm area with sand and carbon filtration. Chemical treatment prior to filtration may be required for some waste streams. Treated process water meeting LDR

requirements may be reused for moisture conditioning of wastes in the solidification and stabilization process, or sent to the facilities solar evaporation ponds.

2.9 Air Emission Controls

Any residual non-condensable organic vapors are passed through a thermal oxidizer for complete destruction. The thermal oxidizer operation and performance is regulated by the facilities ACDP permit.

- ORU-2 SYSTEM TANKS

The following twenty-one (21) tanks are used in the ORU treatment system. Tank numbers listed below coincide with tank numbers provided on the flow diagram in Appendix B. All hazardous waste storage tanks associated with the ORU treatment system are managed in accordance with Standalone #8 – *Bulk Storage Plan*.

Table 22-3: ORU-2 Tank Listing

TANK #	DESCRIPTION	TYPE	CAPACITY (Gal)
RCRA Tanks			
F-1301	Interceptor	Above ground, horizontal, flat bottom, CS	3,000
F-1401	Oil Water Separator	Above ground, horizontal, cone bottom, CS	13,200
F-1402	Process Water Tank	Above ground, vertical, cone bottom, CS	20,000
F-1403	Process Water Mix Tank 1	Above ground, vertical, cone bottom, CS	20,000
F-1404	Process Water Mix Tank 2	Above ground, vertical, cone bottom, CS	20,000
F-1405	Treated Process Water Tank 1	Above ground, vertical, cone bottom, CS	20,000
F-1406	Treated Process Water Tank 2	Above ground, vertical, cone bottom, CS	20,000
F-1407	Treated Process Water Tank 3	Above ground, vertical, cone bottom, CS	20,000
F-1408	Treated Process Water Tank 4	Above ground, vertical, cone bottom, CS	20,000
F-1409	Treated Process Water Tank 5	Above ground, vertical, cone bottom, CS	20,000
F-1410	Treated Process Water Tank 6	Above ground, vertical, cone bottom, CS	20,000
F-1411	Treated Process Water Tank 7	Above ground, vertical, cone bottom, CS	20,000
F-1412	Treated Process Water Tank 8	Above ground, vertical, cone bottom, CS	20,000
F-1413	Treated Process Water Tank 9	Above ground, vertical, cone bottom, CS	20,000
F-1414	Treated Process Water Tank 10	Above ground, vertical, cone bottom, CS	20,000
F-1415	Treated Process Water Tank 11	Above ground, vertical, cone bottom, CS	20,000
F-1416	Treated Process Water Tank 12	Above ground, vertical, cone bottom, CS	20,000
ME-1101	Mix Hopper A	Above Ground Mix/Feed Hopper, CS	7,473
ME-1102	Feed Hopper B	Above Ground Feed Hopper	1,742
V-1401A	Sand Filter A	Above Ground Sand Filter A	100
V-1401B	Sand Filter B	Above Ground Sand Filter B	100
V-1402	Carbon Filter	Stainless Steel	3,950
Non-RCRA Tanks			
F-1417	Product Tank 1	Above ground, vertical, cone bottom, CS	20,000
F-1418	Product Tank 2	Above ground, vertical, cone bottom, CS	20,000
F-1419	Product Tank 3	Above ground, vertical, cone bottom, CS	20,000

- SYSTEM SECONDARY CONTAINMENT

The ORU-2 System containment is made up of 5 separate containment systems as listed below:

Table 22-4: ORU-2 System Containment

Site Plan Identifier	Area Description	Construction	Required Containment	Actual Containment
C	ORU System Equipment	Reinforced Concrete	3,739.3 ft^3	4,101.3 ft^3
B3	Product Tank Storage	Reinforced Concrete	2,948.6 ft^3	3,152.5 ft^3
B2	Process Water Treatment Area	Reinforced Concrete	2,932.1 ft^3	3,502.5 ft^3
B1	Treated Water Storage	Reinforced Concrete	3,433.3 ft^3	6,265.2 ft^3
D	Mixing Hopper Vault	Reinforced Concrete	1,018.4 ft^3	9,781.3 ft^3
A	Truck Offload Area	Reinforced Concrete	120 ft^3	159.8 ft^3

All ORU-2 containment areas are designed to meet the requirements contained in 40 CFR §264.193. 40 CFR §264.193(e)(2) requires that the secondary containment areas be large enough to contain the capacity of the largest tank plus precipitation from a 25-year, 24-hour storm, (refer to Appendix C for containment calculations). All joints in containment slabs are constructed with chemical-resistant waterstops meeting the requirements of 40 CFR §264.193(e)(2)(iii)). The slab is coated with a chemically compatible impermeable coating meeting the requirements of 40 CFR §264.193(e)(2)(iv)). Stormwater collected from the sumps in these containment areas will be pumped to the process water system and ultimately treated through the process water treatment system. The P.E. certification of the containment structures and tanks required by 40 CFR 264.192(b) will be maintained at the facility in the operating record.

- ORU-2 OPERATIONS

5.1 Organic Recovery Unit Contaminated Waste Handling

Following arrival and acceptance of the waste, the wastes are either stored in approved storage areas or fed directly into the treatment system through two feed hoppers in the system.

5.2 Subpart CC Waste Handling

Wastes subject to Subpart CC Level 1 controls will be stored or accepted in roll-off boxes and dump type vehicles may be placed on the slab floor in Containment Building B-5. Wastes subject to Subpart CC Level 2 controls will remain in the Level 2 shipping containers in accordance with Standalone # 9 - *Container Storage Design and Operations Plan* until they are transferred to the ORU-2 outside mixing feed hopper and amended with drying agents as necessary. Wastes with higher moisture contents may also be mixed with dryer materials in the mixing feed hopper or inside Building B-5 to attain appropriated moisture content.

5.3 Subpart FF Waste Handling

CWMNW tracks the facility's Total Annual Benzene (TAB) and it has historically been less than 1 Mg; therefore, CWMNW is not subject to controls in Subpart FF. However, in the event that generators require their specific wastes to be managed under controls, wastes subject to 40 CFR 61, Subpart FF may be handled in controlled containers such as roll off boxes until the material is transferred into the ORU-2 mixing feed hopper. These wastes will be maintained in containers that meet BWON control requirements, and shall be inspected and monitored in order to comply with all related standards. The vapors throughout the ORU feed system are routed through closed-vent systems to control devices, and all the equipment and piping lines are subject to BWON inspection and monitoring requirements.

5.4 Waste Preparation for Organic Recovery

In general, waste preparation improves the ability of the ORU-2 to treat the contaminated waste. This preparation includes specific operations for screen sizing and size reduction that are also dependent on the uniformity, moisture, and liquid content of the incoming contaminated waste.

Screening (vibrating or non-vibrating) is a primary operation, and wastes are screened or strained to remove debris. Blending low and high concentration waste or high and low boiling point wastes optimizes the operation and reduces problems in liquids recovery.

5.5 Organic Recovery Unit Treatment Capacity ORU-2

The indirect-fired ATDU has an ultimate design capacity of 30 million British thermal units (30 MMBtu), and a theoretical heat transfer efficiency of 60-percent. The temperature capacity of the system is 1,200°F. The actual operating temperatures vary depending upon the boiling points of the organic constituents being extracted such that optimal fuel consumption is maintained.

The theoretical treatment capacity of the system (tons/hour) depends primarily upon the moisture content of the waste and the thermal capacity of the ATDU. Appendix D provides the estimated treatment capacity of the system running at 900° F, based upon the moisture content of incoming waste, and using a thermal transfer efficiency of 60-percent.

- ORU-2 REGULATORY STANDARDS

6.1 Organic Recovery Unit - 40 CFR Part 264 Subparts J/X Compliance

6.1.1 40 CFR Part 264, Subpart J Compliance

The ORU contains process water tanks that store and/or treat hazardous waste and are subject to 40 CFR Part 264, Subpart J. These tanks are managed in compliance with Standalone #8 - *Bulk Storage Plan*, which contains requirements for inspection and operation of these tanks. The hazardous waste storage tank systems in both of the ORU systems have been adequately designed, have sufficient structural integrity, and are acceptable for storing hazardous waste. Required engineer's certifications are contained in Standalone #8 - *Bulk Storage Plan*. Further, the tanks are provided with sufficient secondary containment meeting the requirements of 40 CFR 264.193. Containment calculations for the system are shown in Appendix C. All tanks associated with the ORU are included in Standalone #8 - *Bulk Storage Plan*, which includes all permitted RCRA tanks at the facility.

In the event of any leak or spill from a tank system or secondary containment system, the facility shall comply with response requirements per 40 CFR 264.196. Closure and post-closure care of the hazardous waste tank systems are discussed in Standalone #5 – *Closure/Post-Closure Plan*.

6.1.2 40 CFR Part 264, Subpart X Compliance

The ORU-2 treatment system contains a thermal desorption unit (TDU) and shaker screen equipment that is subject to 40 CFR Part 264, Subpart X. These miscellaneous units are most similar to tank systems; and thus, the applicable and appropriate provisions of 40 CFR Part 264, Subpart J shall be complied with to ensure protection of human health and the environment. Standalone #23 – Subpart X units includes these pieces of equipment.

6.2 Routine Tank Inspections

The elements and frequency of routine inspections of ORU-2 systems hazardous waste tanks, piping and containment are included in Standalone #3 - *Inspection Plan*. The tanks and piping shall be inspected for visible leaks and general condition. The overfill alarm systems shall be tested to insure they are in working order. The containment area and sumps shall be inspected for evidence of any liquid collection and evidence of any leakage from the associated pipes, pumps, tanks and equipment contained within the area. An inspection form for both the ORU systems tanks, piping and containment is contained in Standalone #3 - *Inspection Plan*.

6.3 RCRA Subparts AA, BB and CC and Benzene NESHAPS - Applicability and Compliance for Organic Recovery Systems

6.3.1 40 CFR Part 264, Subpart AA Applicability

40 CFR Part 264, Subpart AA defines the air emission standards for process vents associated with distillation, fractionation, thin-film evaporation, solvent extraction, or air or steam stripping operations. ORU-2 does not contain any distillation, fractionation, thin-film evaporation, solvent

extraction, or air or steam streaming operation; and thus, 40 CFR Part 264, Subpart AA does not apply to either ORU Treatment system and subsystems.

6.3.2 40 CFR Part 264, Subpart BB Applicability and Compliance

ORU-2 systems are subject to the requirements of 40 CFR Part 270; and thus, all equipment that contains or contacts hazardous waste with organic concentrations of at least 10 percent by weight is subject to 40 CFR Part 264, Subpart BB. Compliance requirements for 40 CFR Part 264, Subpart BB is discussed in the Organic Recovery Unit Controls and Monitoring section below

6.3.3 40 CFR Part 264, Subpart CC Applicability

The requirements of 40 CFR Part 264, Subpart CC apply to owners and operators of all facilities that treat, store, or dispose of hazardous waste in tanks, surface impoundments, or containers subject to 40 CFR Part 264, Subparts I, J, or K. As discussed in Section 3.6.1, the ORU does contain hazardous waste storage tanks subject to 40 CFR Part 264, Subpart J; however, per 40 CFR 264.1080(b)(7), the requirements of 40 CFR Part 264, Subpart CC do not apply to a hazardous waste management unit that the owner or operator certifies is equipped with and operating air emission controls in accordance with the requirements of an applicable Clean Air Act regulation codified under 40 CFR Part 60, Part 61, or Part 63. All hazardous waste storage tanks in the ORU are equipped with and operate with air emission controls in accordance with 40 CFR Part 61, Subpart FF; and thus, the hazardous waste storage tanks in the ORU are not subject to 40 CFR Part 264, Subpart CC. All 40 CFR Part 264, Subpart CC requirements, if any, are contained in the facilities ACDP Permit.

Subpart CC regulations are applicable to containers which are not handled in accordance with 40 CFR Part 61, Subpart FF, having a design capacity greater than 0.1 m^3 (approximately 26 gallons), and containing hazardous waste that has an average volatile organic (VO) concentration greater than 500 ppm by weight (ppmw) at the point of waste generation. Waste received at the facility for ORU treatment will typically arrive or be placed in containers that are larger than the exempted capacity and may contain hazardous waste with VO concentrations greater than 500 ppmw. CWMNW complies with Subpart CC container standards as provided in the Permit and Standalone # 9 - *Container Storage Design and Operations Plan*. In addition, the waste in any container is unloaded in an expedient manner to minimize potential organic air emissions. If, for any reason, unloading of the contaminated waste does not commence immediately, the container is to be kept covered with a lid that meets Subpart CC Level 1 controls. The lid or cover forms a continuous barrier over the entire surface area with no visible cracks, holes, gaps or other open spaces.

6.3.4 40 CFR Part 61, Subpart FF Applicability and Compliance

The ORU at certain times is subject to 40 CFR Part 61, Subpart FF (BWON), since it is part of a facility that intermittently treats, stores, and disposes of BWON wastes from chemical plants and petroleum refineries where the regulation does apply. CWMNW tracks the facility's Total Annual Benzene (TAB), and has historically been less than 1 Mg. Therefore, CWMNW facility is not subject to controls in Subpart FF. However, should the generator require their specific wastes be managed under controls, wastes subject to 40 CFR 61, Subpart FF may be handled in controlled containers such as roll off boxes until the material is loaded into the mixing feed hopper. These wastes shall be maintained in containers that meet BWON control requirements,

and shall be inspected and monitored as to comply with all related standards. The vapors throughout the ORU-2 feed system are routed through closed-vent systems to control devices, and all the equipment and piping lines are subject to BWON inspection and monitoring requirements.

All fixed-roof tanks shall have no detectable emissions in accordance with Method 21 standards and must be closed and sealed unless it is opened for sampling, inspections, maintenance, repair or removal of the waste. All organic vapors that are vented shall be maintained in a closed-vent system that routes to the thermal oxidizer control device.

In instances where the tank is venting to the atmosphere by a pressure relief device, these devices must remain in closed, sealed positions during normal operations. They may be opened if it is necessary to prevent damage or permanent disfiguration to tank, during filling or emptying, or during malfunctions. This follows the alternative standard for tanks under 40 CFR 61.351, allowing tanks handling primarily organic material to have only a pressure relief device.

The oil water separator in the ORU system is vented to the closed vent system and to the thermal oxidizer control device.

- ORU-2 CONTROLS AND MONITORING

The entire ORU-2 unit is centrally-monitored and controlled using a SCADA control package. The computer-based process controls provide graphic screens for effective plant control, monitoring, and data storage. The ORU-2 SCADA control system allow real-time access to all key plant parameters, and records the required operating parameters for compliance with the Part B permit and the ACDP permit. The demonstrated compliance SCADA system records the following parameters:

- Monitoring point CP1 - TDU Flue gas temperature - Deg F
- Monitoring point CP2 - TDU Syngas temperature - Deg F
- Monitoring point CP3 – TDU Infeed rate - TPH
- Monitoring point CP4 - Thermal oxidizer chamber temperature - Deg F
- Monitoring Point CP5 - Thermal oxidizer feed valve position – Open/Closed

The SCADA process controls enable the operator to improve system capacity, optimize fuel consumption, and protect the system against accidental malfunctions. The computerized system includes automatic fail safes for controlled shutdown of the system during upsets.

The process instrumentation and electrical switch gear is housed in a motor control center. The SCADA control system and operators control station is located in the control room south of the thermal processing system. Plant operators are trained in the operational and maintenance aspects of the system and these requirements are contained in Standalone #2 - *Security Procedures, Hazard Prevention, and Training Plan.*

7.1 Control Device Monitoring

The emissions control devices throughout the ORU system require monitoring of several different parameters, and the requirements for these are established in the facilities ACDP permit. The facility shall manage leaks identified by regular inspections in compliance with the requirements in 40 CFR Part 264.1064.

7.2 Tank Monitoring

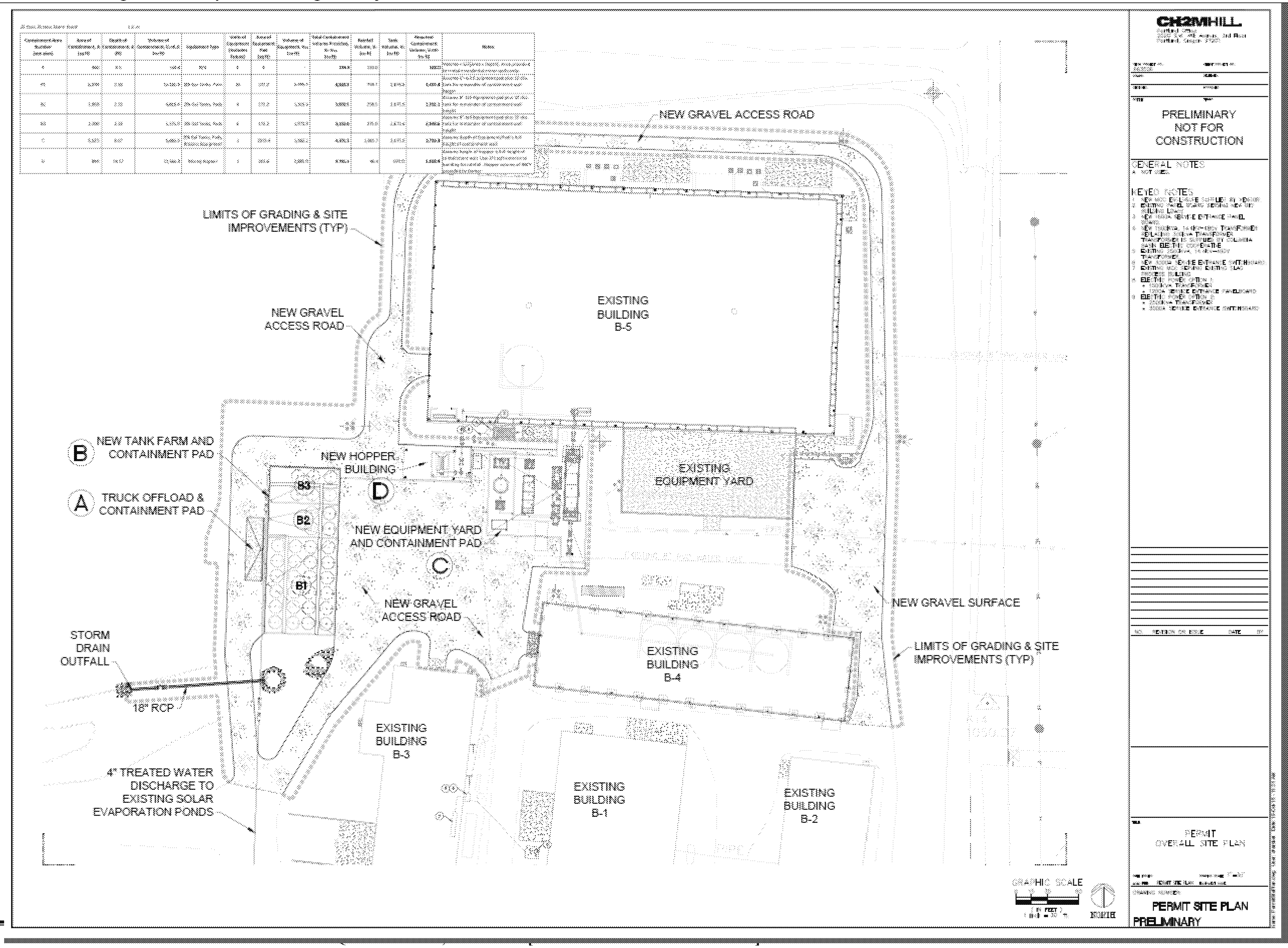
As indicated in Section 3.6.3, all hazardous waste storage tanks in the ORU-2 system are equipped with and operate with air emission controls in accordance with 40 CFR Part 61, Subpart FF; and thus, the hazardous waste storage tanks in the ORU-2 system are not subject to 40 CFR Part 264, Subpart CC. The facility shall comply with all applicable requirements under 40 CFR Part 61, Subpart FF. All hazardous waste tanks are equipped with a fixed roof cover and shall be visually inspected by the owner and operator quarterly, and monitored via Method 21 annually. If leaks are detected, responses and recordkeeping shall be made in compliance with 40 CFR Part 264, Subpart BB and 40 CFR 264.1064.

7.3 Other Equipment Monitoring

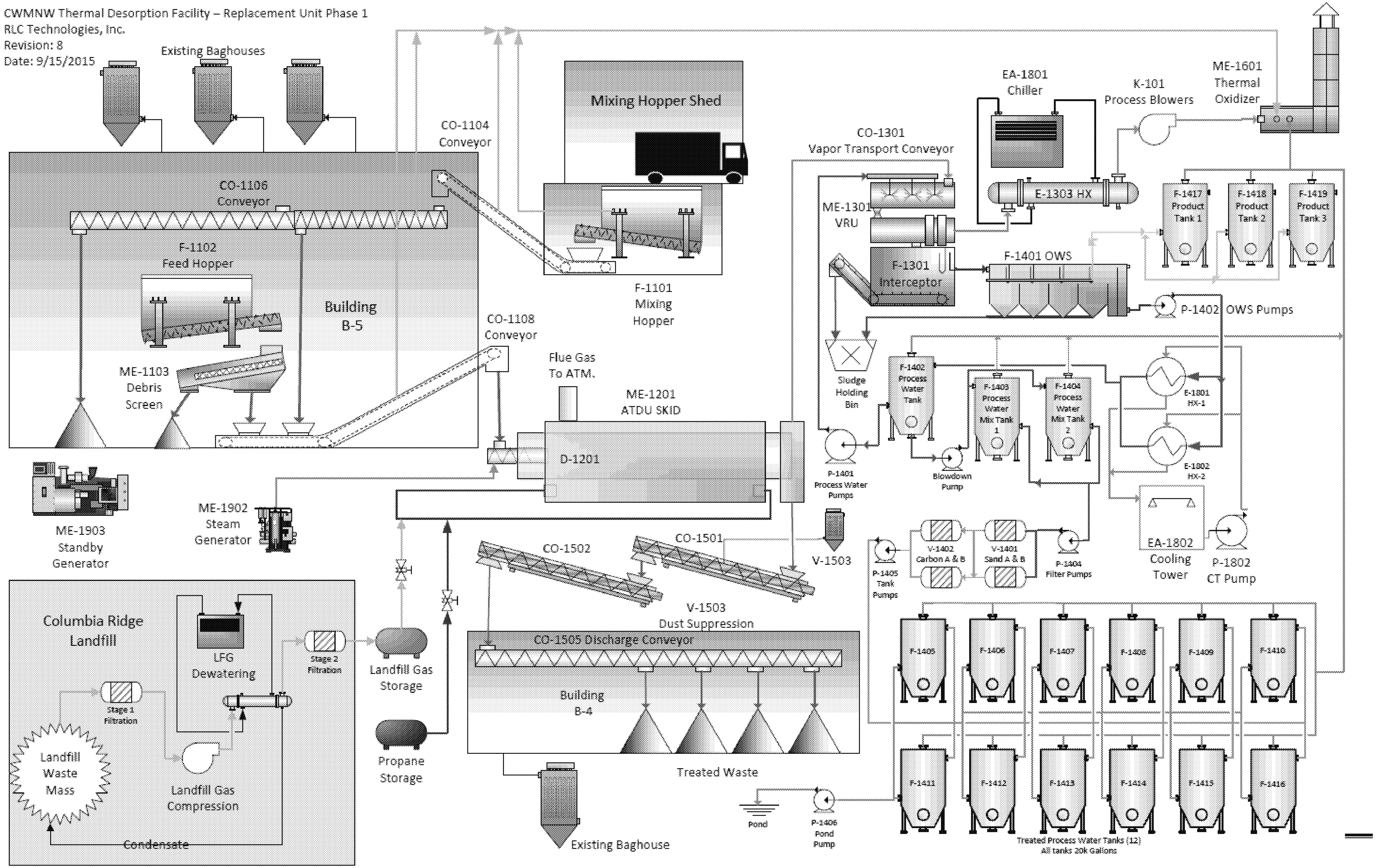
The ORU-2 is in heavy liquid service, and all pumps, valves, and pressure relief devices shall be observed for potential leaks using the following methods: Audible, Visual, and Olfactory (AVO), per 40 CFR Part 264, Subpart BB. There is no stated monitoring frequency for equipment in heavy liquid service according to 40 CFR Part 264, Subpart BB; however, monitoring shall be conducted quarterly consistent with industry best management practices, and to satisfy the BWON quarterly visual inspection requirements. When a leak is discovered, 40 CFR Part 60, Method 21 shall be used to measure the severity.

All sampling stations within ORU-2 system shall be built and kept up to design and installation requirements in order to stay compliant with 40 CFR, Subpart BB. All operational open-ended lines or pipes shall have a cap, plug, or double valve system when not in use.

APPENDIX A
AS-BUILT DESIGN PLANS FOR ORU-2


CH2MHILL
PRELIMINARY
NOT FOR
CONSTRUCTION
GENERAL NOTES
KEYED NOTES
NEW GRAVEL ACCESS ROAD
LIMITS OF GRADING & SITE
IMPROVEMENTS (TYP)
EXISTING
BUILDING
B-5
NEW GRAVEL
ACCESS ROAD
B
NEW TANK FARM AND
CONTAINMENT PAD
NEW HOPPER
BUILDING
D
A
TRUCK OFFLOAD &
CONTAINMENT PAD
B3
B2
B1
EXISTING
EQUIPMENT YARD
NEW EQUIPMENT YARD
AND CONTAINMENT PAD
C
NEW GRAVEL
ACCESS ROAD
NEW GRAVEL SURFACE
STORM
DRAIN
OUTFALL
18" RCP
EXISTING
BUILDING
B-4
LIMITS OF GRADING & SITE
IMPROVEMENTS (TYP)
EXISTING
BUILDING
B-3
4" TREATED WATER
DISCHARGE TO
EXISTING SOLAR
EVAPORATION PONDS
EXISTING
BUILDING
B-1
EXISTING
BUILDING
B-2
PERMIT
OVERALL SITE PLAN
GRAPHIC SCALE
NORTH
PERMIT SITE PLAN
PRELIMINARY

APPENDIX B
PROCESS FLOW DIAGRAM


CWMNW Thermal Desorption Facility – Replacement Unit Phase 1
RLC Technologies, Inc.
Revision: 8
Date: 9/15/2015
Existing Baghouses
Mixing Hopper Shed
CO-1104 Conveyor
CO-1106 Conveyor
F-1102 Feed Hopper
Building B-5
ME-1103 Debris Screen
CO-1108 Conveyor
F-1101 Mixing Hopper
Flue Gas To ATM.
ME-1201 ATDU SKID
D-1201
CO-1301 Vapor Transport Conveyor
ME-1301 VRU
F-1301 Interceptor
EA-1801 Chiller
E-1303 HX
K-101 Process Blowers
ME-1601 Thermal Oxidizer
F-1417 Product Tank 1
F-1418 Product Tank 2
F-1419 Product Tank 3
F-1401 OWS
P-1402 OWS Pumps
Sludge Holding Bin
F-1402 Process Water Tank
F-1403 Process Water Mix Tank 1
F-1404 Process Water Mix Tank 2
E-1801 HX-1
E-1802 HX-2
P-1401 Process Water Pumps
Blowdown Pump
ME-1903 Standby Generator
ME-1902 Steam Generator
CO-1502
CO-1501
V-1503
V-1503 Dust Suppression
V-1402 Carbon A & B
V-1401 Sand A & B
P-1404 Filter Pumps
P-1405 Tank Pumps
EA-1802 Cooling Tower
P-1802 CT Pump
Columbia Ridge Landfill
LFG Dewatering
Stage 2 Filtration
Stage 1 Filtration
Landfill Waste Mass
Landfill Gas Compression
Condensate
Landfill Gas Storage
Propane Storage
CO-1505 Discharge Conveyor
Building B-4
Treated Waste
Existing Baghouse
Pond
P-1406 Pond Pump
F-1405
F-1406
F-1407
F-1408
F-1409
F-1410
F-1411
F-1412
F-1413
F-1414
F-1415
F-1416
Treated Process Water Tanks (12)
All tanks 20k Gallons

APPENDIX C
SECONDARY CONTAINMENT CALCULATIONS

25 Year, 25 Hour Storm Event *1.5 in*

Containment Area Number (see plan)	Area of Containment, A (sq ft)	Depth of Containment, d (ft)	Volume of Containment, V_c=A.d (cu ft)	Equipment Type	Units of Equipment (Includes Future)	Area of Equipment Pad (sq ft)	Volume of Equipment, V_{eq} (cu ft)	Total Containment Volume Provided, V_c-V_{eq} (cu ft)	Rainfall Volume, V_r (cu ft)	Tank Volume, V_t (cu ft)	Required Containment Volume, V_r+V_t (cu ft)	Notes
A	960	0.5	159.8	N/A	0	0	-	159.8	120.0	-	120.0	Volume = 1/3[Area x Depth]. Area provided to contain incidental minor spills only.
B1	6,078	2.33	14,160.8	20k Gal Tanks, Pads	34	172.2	7,895.5	6,265.2	759.7	2,673.6	3,433.3	Assume 6"-tall Equipment pad plus 12' dia. tank for remainder of containment wall height
B2	2,068	2.33	4,818.4	20k Gal Tanks, Pads	4	172.2	1,315.9	3,502.5	258.5	2,673.6	2,932.1	Assume 6"-tall Equipment pad plus 12' dia. tank for remainder of containment wall height
B3	2,200	2.33	5,125.9	20k Gal Tanks, Pads	4	172.2	1,973.9	3,152.0	275.0	2,673.6	2,948.6	Assume 6"-tall Equipment pad plus 12' dia. tank for remainder of containment wall height
C	8,525	0.67	5,683.5	20k Gal Tanks, Pads, Process Equipment	1	2373.4	1,582.2	4,101.3	1,065.7	2,673.6	3,739.3	Assume depth of Equipment/Pad is full height of containment wall
D	894	14.17	12,666.3	Mixing Hopper	1	203.6	2,885.0	9,781.3	46.4	972.0	1,018.4	Assume height of hopper is full height of containment wall. Use 371 sqft exterior to building for rainfall. Hopper volume of 36CY provided by Owner.

PRELIMINARY
NOT FOR CONSTRUCTION

APPENDIX D
TDU SYSTEM CAPACITY

RLC Technologies TDU System Capacity 30.0 MMBTU/HR

MMBTU/HR Required

	Tons per Hour																			
% Water	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
0%	0.692	1.383	2.075	2.767	3.458	4.150	4.842	5.533	6.225	6.917	7.608	8.300	8.992	9.683	10.375	11.067	11.758	12.450	13.142	13.833
5%	0.898	1.796	2.694	3.591	4.489	5.387	6.285	7.183	8.081	8.979	9.877	10.774	11.672	12.570	13.468	14.366	15.264	16.162	17.060	17.957
10%	1.104	2.208	3.312	4.416	5.520	6.624	7.729	8.833	9.937	11.041	12.145	13.249	14.353	15.457	16.561	17.665				
15%	1.310	2.621	3.931	5.241	6.551	7.862	9.172	10.482	11.792	13.103	14.413	15.723	17.034							
20%	1.516	3.033	4.549	6.066	7.582	9.099	10.615	12.132	13.648	15.165	16.681									
25%	1.723	3.445	5.168	6.891	8.613	10.336	12.059	13.781	15.504	17.227										
30%	1.929	3.858	5.787	7.716	9.644	11.573	13.502	15.431	17.360											
35%	2.135	4.270	6.405	8.540	10.675	12.811	14.946	17.081												
40%	2.341	4.683	7.024	9.365	11.706	14.048	16.389													
45%	2.547	5.095	7.642	10.190	12.737	15.285	17.832													
50%	2.754	5.507	8.261	11.015	13.769	16.522														
55%	2.960	5.920	8.880	11.840	14.800	17.759														
60%	3.166	6.332	9.498	12.664	15.831															
65%	3.372	6.745	10.117	13.489	16.862															
70%	3.579	7.157	10.736	14.314	17.893															
75%	3.785	7.569	11.354	15.139																
80%	3.991	7.982	11.973	15.964																
85%	4.197	8.394	12.591	16.788																
90%	4.403	8.807	13.210	17.613																
95%	4.610	9.219	13.829																	
100%	4.816	9.631	14.447																	

****** MMBTU/HR required estimates above use 60% Thermal Transfer Efficiency and 900Deg F operating temperatures**

Message

From:	Knittel, Janette [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=a955f914e8d34cb19b6f63ac60707d32-Knittel, Janette]
Sent:	8/4/2017 5:28:24 PM
To:	Davies, Lynne [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=169eb6cbdebb4caf85f76390b8ab2674-LDavie12]
Subject:	FW: Updated Draft Issue Papers
Attachments:	PIT_Issue_Summary_TDU_7.31.17.docx; PIT_Issue_Summary_AABBCC_7.31.17.docx; PIT_Issue_Summary_LDRs_7.31.17.docx; PIT_Issue_Summary_PCC_7.31.17.docx

Hi Lynne. I thought you'd be interested in the draft issue papers attached below. The first three are issues we've discussed re: CWMNW, particularly the first two. Lisa Olson is attending the RCRA BC meeting next week where these will be discussed.
-Janette

From: Olson, Lisa
Sent: Wednesday, August 02, 2017 8:29 AM
To: Bartus, Dave <Bartus.Dave@epa.gov>; Blankenship, Melissa <Blankenship.Melissa@epa.gov>; Castrilli, Laura <Castrilli.Laura@epa.gov>; Hedeen, Roberta <Hedeen.Roberta@epa.gov>; Knittel, Janette <Knittel.Janette@epa.gov>; Macduff, Sean <macduff.sean@epa.gov>; Palumbo, Janice <Palumbo.Jan@epa.gov>; Valdez, Heather <Valdez.Heather@epa.gov>
Subject: FW: Updated Draft Issue Papers

Good morning,

FYI - Attached below are the four draft issues papers that we provided comments on. These will be shared with the Branch Chiefs next week and later on with the Division Directors, who will decide which issues to work on at the national level.

Thanks –

Lisa

Lisa Olson
US EPA Region 10, Office of Air and Waste
1200 Sixth Avenue, M/S: AWT-150
Seattle, WA 98101
Desk: 206-553-0176
Cell: 206-321-2767

****
Subject: Updated Draft Issue Papers

Hello Permit Integrity Team,

Here are the updated drafts of the 4 issue papers that we are going to share at the Branch Chiefs Meeting next week. Thank you to all of you who contributed! Please keep in mind that these are going to be considered as working drafts all the way until we present them to the RCRA DD's for decision/prioritization; so feel free to continue gathering feedback from your states.

PIT_Issue_Sum... PIT_Issue_Sum... PIT_Issue_Sum... PIT_Issue_Sum...

Thank you,

Lilybeth

Lilybeth Colón | Environmental Engineer
U.S. EPA | OLEM | Office of Resource Conservation and Recovery
T: 703-308-2392 | O: Potomac Yard South: Mail Code: 5303P

Message

From: Knittel, Janette [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=a955f914e8d34cb19b6f63ac60707d32-Knittel, Janette]
Sent: 6/6/2017 11:29:10 PM
To: Dossett, Donald [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=c4183298cd1742b5a39829e31c720571-Dossett, Don]
CC: McArthur, Lisa [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=524660efbdb140e7868646d8073f0c72-McArthur, Lisa]; Valdez, Heather [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=eb323347294d44009a369c3576798bdf-Valdez, Heather]; Davies, Lynne [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=169eb6cbdebb4caf85f76390b8ab2674-LDavie12]
Subject: memo re: Chem Waste ORU RCRA/Air issue
Attachments: 17 06 06 Chem Waste Don Dossett Memo v2.docx; SA 22 Draft Clean.docx; 11-0002-SI-01-PmtMod1-28517-FNL.docx; 11-0002-SI-01-RRmod1-28517-FNL.docx; RO 13657.pdf; RO 14266.pdf; 4-27-90 Preamble Proposed Rule 55FR17869 - Definitions of infrared incinerators.pdf

Hi Don,
Lisa told you I would be sending you a brief paper that summarizes the gist of the issue we're facing regarding the Organic Recovery Unit at the Chem Waste facility in Oregon. Attached please find the memo along with the attachments which are listed at the bottom of the memo. After you have a chance to digest this, Lisa, Heather, and I would like to meet with you. I'll be on leave until Tuesday, June 13. I'll set up a meeting when I return.

Thanks for your time,
Janette

Janette Knittel
U.S. EPA Region 10
Office of Air and Waste
RCRA Corrective Action, Permits, and PCB Unit
1200 6th Ave, Suite 900, OAW-150
Seattle, WA 98101-3140
206-553-0483
knittel.janette@epa.gov

be addressed under the SIP process or potentially by a RCRA permit writer using the omnibus permitting authority.

In developing today's proposed rule, a number of people representing a wide range of interests (e.g., industry representatives, environmentalists) have indicated, however, that the rule may be simpler to implement and more protective if the controls were technology-based. They advocate using risk assessment only as a check to determine if the standards are protective on a site-specific basis. They cite the current limitations of risk-based standards in this particular situation, including: (1) indirect exposure (e.g., uptake through the food chain) has not been considered for carcinogens; (2) metals controls are proposed only for those metals for which sufficient health effects data exist to establish acceptable ambient levels; and (3) the metals controls are difficult to implement by limiting feed rates of individual metals given the physical matrices of wastes and the variability of metals concentrations. We agree with these concerns and are initiating a testing program to develop technology-based controls for particulate matter to provide a measure of control for particulates, including metal particulates and adsorbed organic compounds, commensurate with best demonstrated technology (BDT) for hazardous waste incinerators. See RCRA section 3004(a)(1)—section 3004 standards are to be revised periodically to take into account improvements of measurement and technology. If EPA establishes a BDT particulate standard, the risk-based controls for metals emissions would still apply and would then be used as a check to determine if the BDT standard provides adequate protection on a case-by-case basis. Given the limitations of current risk assessment methodologies, we do not believe that it could be demonstrated that a BDT standard substantially over-regulates in many situations.

We are not proposing at this time to lower the existing particulate standard because we have not conducted adequate field testing of hazardous waste incinerators to establish a BDT particulate standard.[12] Further, once the BDT standard is identified, we would then need to consider the impact on the regulated community of applying the standard to establish a reasonable compliance schedule.

II. Definitions of Incinerators and Industrial Furnaces

We discuss below the basis for proposing to revise the definitions of incinerator and industrial furnace, the regulatory status for sludge dryers, and a request for comment on regulating all hazardous waste thermal treatment devices under parts 264 and 265, subpart O.

A. Definition of Incinerator and Industrial Furnace

Existing definitions in § 260.10 for incinerators and industrial furnaces consider how thermal energy is provided to the device. Both definitions stipulate that the device must utilize controlled flame combustion, thus excluding devices using other means to supply the heat necessary to combust or otherwise themally treat waste. Thus, for example, electric arc smelters are not industrial furnaces and devices using infrared heat to destroy waste are not incinerators. Significant regulatory consequences result from these determinations. Electric arc smelters that reclaim nonindigenous metal hydroxide sludges are not industrial furnaces, and, thus, are exempt from regulation under § 261.6(c)(1), while smelters using direct flame combustion to reclaim the same sludge would be regulated under the May 6, 1987, proposed rules for boilers and industrial furnaces. Infrared devices used to destroy waste would be regulated under the subpart X permit standards of part 264 and the subpart P interim status standards of part 265, while controlled flame incinerators would be regulated under subpart O of parts 264 and 265 (and any amendments resulting from today's proposal). The subpart X permit standards under part 264 are not prescriptive; permit writers use engineering judgment and risk analysis to determine appropriate permit conditions.

We believe that incinerators and industrial furnaces pose much the same risk irrespective of whether they use controlled flame combustion or some other means to provide heat energy. Therefore, we are proposing to replace or temper the reference to controlled flame combustion in respective definitions.

1. *Revised definition of industrial furnace.* We are proposing to revise the definition of industrial furnace to refer to thermal treatment rather than to controlled flame combustion. We believe that there are very few additional industrial furnaces (that process nonindigenous waste) that would be regulated under this expanded definition, and it makes no sense to regulate these few furnaces differently than other industrial furnaces processing the same materials. EPA specifically requests comments on the need for the revised industrial furnace definition and resulant impacts on the regulated community.

2. *Plasma arc and infrared devices are incinertors.* We are proposing to revise the definition of incinerator to include explicitly two nonflame combustion devices: plasma arc and infrared incinerators. Although these devices are sometimes considered to be nonflame devices rather than incinerators, we believe that they should be regulated as Subpart O incinerators for two reasons. First, they invariably employ afterburners to combust hydrocarbons driven off by the plasma arc or infrared process. Thus, it can be argued that these units, in fact, meet the current definition of an incinerator. Second, we believe that the Subpart O incinerator standards can be appropriately applied to these devices; the technical requirements of subpart O are appropriate to address the hazards posed by these devices. We also note that applying the Subpart O standards will reduce the burden on both permit writers and applicants. The Subpart X standards are nonprescriptive standards under which permit writers apply permit conditions as appropriate to protect human health and the environment. Thus, under subpart X, permit writers would need to determine on a case-by-case basis whether particular provisions of subpart O are appropriate and whether additional permit conditions would be needed. Using Subpart O strandards removes the ambiguity for both permit writers and applicants over what requirements are necessary.

Today's proposed amendments to the incinerator standards likewise appear suitable for plasma arc and infrared incinerators. We request comment on whether there are other "nonflame" combustion devices for which the Subpart O incinerator standards are applicable (i.e., devices that use an afterburner to combust hydrocarbons generated from hazardous waste by a nonflame process).

We note that we are proposing only to change (or clarify) the regulatory status of these two classes of devices, not to subject them to regulation for the first time. Thus, interim status is not being reopened for these devices. They have

[12] We note that several States control hazardous waste incinerator particulate emissions to levels well below EPA's standard of 0.08 gr/dscf. In addition, several hazardous waste incinerators have been demonstrated to be capable of routinely controlling particulate emissions to levels in the 0.01–0.02 gr/dscf range, or less. Further, as discussed above in the text, the proposed particulate standard for MWCs is 0.015 gr/dscf. Thus, we anticipate that a BDT particulate standard for hazardous waste incinerators would be within that range of 0.01 to 0.02 gr/dscf.

been regulated since 1980 under subpart P (interim status standards for thermal treatment units), subpart X (permit standards for other treatment units), or subpart O (interim status and permit standards for incinerators). We note that the interim status standards of part 265, subpart P, are virtually identical to the interim status standards of part 265, subpart O.

3. *Fluidized bed devices are incinerators.* EPA would also like to clarify that fluidized bed devices are incinerators and are regulated under subpart O. They are not subject to the thermal treatment standards of part 265, subpart P, or requirements established under part 264, subpart X. Fluidized bed incinerators are enclosed devices that are designed to provide contact between a heated inert bed material fluidized with air and the solid waste. Gas is passed upwards through a column of fine particulates at a sufficient velocity to cause the solids/gas mixture to behave like a liquid. The bed is preheated by overfired or underfired auxiliary fuel. It is generally accepted that fluidized beds meet the definition of incinerator, although there may have been some confusion in the past. Although we are clarifying that they do meet the definition of incincerator, we specifically request comment on whether there is sufficient ambiguity to warrant adding fluidized bed devices to the definition of incinerator.

4. *Revised regulatory status of carbon regeneration units.* We are also proposing to revise the regulatory status of carbon regeneration units. Controlled flame carbon regeneration units currently meet the definition of incinerator and have been subject to regulation as such since 1980,[13] while carbon regeneration nonflame units have been treated as exempt reclamation units. We are proposing to regulate both direct flame and nonflame carbon regeneration units as thermal treatment units under the interim status standards of part 265, subpart P, and the permit standards of part 264, subpart X. Our reason for doing this is that we are concerned that emissions from these devices may present a substantial hazard to human health or the environment. We are not proposing to apply the part 264, subpart O, incinerator standards to these units because we are concerned that demonstration of conformance with the DRE standards (and the proposed CO/THC standards) may not be achievable considering the relatively low levels of toxic organic compounds absorbed onto the activated carbon.

The prevailing view appears to be that carbon regeneration units currently are exempt recycling units. We have considered whether or not these units truly are engaged in reclamation, or whether the regeneration of the carbon is just the concluding aspect of the waste treatment process that commenced with the use of activated carbon to absorb waste contaminants, which are now destroyed in the "regeneration" process.[14] Irrespective of whether these units are better classified as waste treatment or recycling units (or whether the units are flame or nonflame devices), we are concerned, as indicated above, that emissions from the regeneration process can pose a serious hazard to public health if not properly controlled. Consequently, nonflame units in existence on the date of promulgation (like flame units) would be subject to part 265, subpart P, and new units would be subject to part 264, subpart X.

We note that we intend for this proposal to also apply to those carbon regeneration units that meet the definition of wastewater treatment units in § 260.10 while they are in active service. These units would not be exempt from regulation when they are being regenerated because they are no longer treating wastewater. Rather, the activated carbon columns themselves are being treated thermally.

B. Regulation of All Thermal Treatment Units Under Subpart O

The Agency has done some preliminary thinking on an alternative approach to regulating combustion devices—the regulation of all thermal treatment devices under virtually identical standards under subpart O. This would avoid a number of problems with the current regulatory approach, including: (1) Ambiguous definitions for boilers and industrial furnaces; (2) incomplete coverage of the incinerator and industrial furnace definitions (e.g., although today's proposal would expand regulatory coverage of industrial furances to include heating by means other than controlled flame combustion, furances other than those that are "integral components of a manufacturing process" (see § 260.10), such as off-site facilities engaged solely in waste management, could be engaged in *bona fide* reclamation and should be classified as an industrial furnace rather than an incinerator); (3) the burden on the regulated community and EPA and State officials to process petitions to classify individual devices as boilers or industrial furnaces rather than incinerators; and (4) the numerous provisions in the proposed boiler and furnace rules that would merely parrot the current and proposed incinerator standards.

Under this alternative approach, all thermal treatment devices would be regulated under the same risk-based standards to control metals and HCl emissions—the standards proposed today for incinerators.[15] Control of organic emissions could also be the same as those CO controls proposed today for incinerators coupled with the existing DRE standards for incinerators. Devices handling wastes with low levels of toxic organic constituents (e.g., smelters, sludge dryers, certain incinerators), however, would not be subject to organic emissions controls. The applicability of standards could, in many cases, be a function of waste properties and composition. It may not be necessary to identify applicability by type of device.

EPA is continuing to consider this alternative. In particular, we are investigating whether the temporary exclusion for the special wastes in RCRA section 3001(b)(3) and the special standards and exemptions proposed for boilers and industrial furnaces can be implemented without definitions for these devices. We specifically request comments on this alternative regulatory approach whereby all thermal treatment units could be regulated under one set of standards under subpart O.

PART THREE: DISCUSSION OF PROPOSED CONTROLS

I. Overview of EPA's Risk Assessment

In developing this regulation, the Agency has used risk assessment to: (1) determine that absent regulatory

[13] There appears to be confusion as to the current regulatory status of direct flame activated carbon regeneration units. Because EPA indicated in the May 19, 1980, preamble that all activated carbon regeneration units were engaged in a form of recycling presently exempt from regulation (45 FR 33094), EPA is proposing in this notice to amend the regulations to control these devices, both direct and indirect fired. Consequently, the "in existence" date for all activated carbon regeneration units would be the date of promulgation of final regulations.

[14] We note that activated carbon units used as air emissions control devices frequently regenerate the carbon in place by steam stripping, condensing the organic contaminants for reuse. The trapped organics in such columns are not hazardous wastes because the gas originally being treated is not a solid waste (it is an uncontained gas), and therefore any condensed organics do not derive from treatment of a listed hazardous waste.

[15] We note that EPA is requesting comment on applying these controls (as well as the proposed CO controls) to boilers and industrial furnaces as well in lieu of those proposed on May 6, 1987. See the Federal Register notice published today entitled, "Burning of Hazardous Waste in Boilers and Industrial Furnaces: Supplement to Proposed Rule."

State of Oregon Department of Environmental Quality

SIMPLE
AIR CONTAMINANT DISCHARGE PERMIT

Department of Environmental Quality
Eastern Region
475 NE Bellevue Dr., Suite 110
Bend, OR 97701
541-388-6146

This permit is being issued in accordance with the provisions of ORS 468A.040 and based on the land use compatibility findings included in the permit record.

ISSUED TO:

Chemical Waste Management of the Northwest, Inc.
17629 Cedar Springs Lane
Arlington, OR 97812

INFORMATION RELIED UPON:

Application No.: 28517
Date Received: 02/09/2016

PLANT SITE LOCATION:

17629 Cedar Springs Lane
Arlington, OR 97812

LAND USE COMPATIBILITY FINDING:

Approving Authority: Gilliam County
Approval Date: 10/15/2007

ISSUED BY THE DEPARTMENT OF ENVIRONMENTAL QUALITY

(Signature on File)
Mark W. Bailey, Eastern Region Air Quality Manager

April 25, 2016
Dated

Source(s) Permitted to Discharge Air Contaminants (OAR 340-216-8010):

Table 1 Code	Source Description	SIC
Part B, 85	Hazardous Waste Material Disposal Site	4953

Simple Technical Permit Modification
Addendum No. 1

In accordance with OAR 340-216-0020, this permit has been modified.

TABLE OF CONTENTS

1.0 GENERAL EMISSION STANDARDS AND LIMITS

1.1. Visible Emissions

Emissions from any air contaminant source other than fugitive emission sources must not equal or exceed 20% opacity. Opacity must be measured as a six-minute block average using EPA Method 9 or an alternative monitoring method approved by DEQ that is equivalent to EPA Method 9. EPA Method 22 may be used to monitor opacity, but EPA Method 9 must be used to determine compliance with the limit.

1.2. Particulate Matter Emissions

The permittee must comply with the following particulate matter emission limits, as applicable:

a. Particulate matter emissions from any fuel burning equipment such as the Organic Recovery Unit (ORU) or the ORU boiler (ME-1902) must not exceed 0.10 grains per dry standard cubic foot, corrected to 12% CO_2 or 50% excess air.
b. Particulate matter emissions from any air contaminant source other than fuel burning equipment and fugitive emission sources must not exceed 0.10 grains per standard cubic foot.
c. Non-fugitive particulate matter emissions from any process must not exceed the amount shown in Table 1 of OAR 340-226-0310 for the process weight allocated to such a process.

1.3. Fugitive Emissions

The permittee must take reasonable precautions to prevent fugitive dust emissions, as measured by EPA Method 22, by:

a. Using, where possible, water or chemicals for control of dust in the demolition of existing buildings or structures, construction operations, the grading of roads or the clearing of land;
b. Applying water or other suitable chemicals on unpaved roads, materials stockpiles, and other surfaces which can create airborne dusts;
c. Enclosing (full or partial) materials stockpiles in cases where application of water or other suitable chemicals are not sufficient to prevent particulate matter from becoming airborne;
d. Installing and using hoods, fans and fabric filters to enclose and vent the handling of dusty materials;
e. Installing adequate containment during sandblasting or other similar operations;
f. Covering, at all times when in motion, open bodied trucks transporting materials likely to become airborne;
g. Promptly removing earth or other material that does or may become airborne from paved streets; and
h. Developing a DEQ approved fugitive emission control plan upon request by DEQ if the above precautions are not adequate and implementing the plan whenever fugitive emissions leave the property for more than 18 seconds in a six-minute period.

1.4. Particulate Matter Fallout

The permittee must not cause or permit the deposition of any particulate matter larger than 250 microns in size at sufficient duration or quantity, as to create an observable deposition upon the real property of another person.

1.5. Nuisance and Odors

The permittee must not cause or allow air contaminants from any source to cause a nuisance. Nuisance conditions will be verified by DEQ personnel.

1.6. Fuels and Fuel Sulfur Content

a. If the permittee burns any of the fuels listed below, the sulfur content cannot exceed:
   i. 0.0015% sulfur by weight for ultra low sulfur diesel;
   ii. 0.3% sulfur by weight for ASTM Grade 1 distillate oil;
   iii. 0.5% sulfur by weight for ASTM Grade 2 distillate oil;

b. The permittee is allowed to use on-specification used oil as fuel which contains no more than 0.5% sulfur by weight. The permittee must obtain analyses from the marketer or, if generated on site, have the used oil analyzed, so that it can be demonstrated that each shipment of oil does not exceed the used oil specifications contained in 40 CFR Part 279.11, Table 1.

1.7. Emergency Stationary RICE

The permittee must comply with the following requirements for emergency stationary reciprocating internal combustion engines (RICE): [40 CFR 63.6603(a), 63.6625(f), 63.6640(a), and 63.6640(f)(2)]

For each emergency stationary RICE, the permittee must:

a. Change oil and filter every 500 hours of operation or annually, whichever comes first; [40 CFR 63. 6603(a), Table 2d(4)(a)]
b. Inspect air cleaner every 1,000 hours of operation or annually, whichever comes first; [40 CFR 63. 6603(a), Table 2d(4)(b)]
c. Inspect all hoses and belts every 500 hours of operation or annually, whichever comes first, and replace as necessary; [40 CFR 63. 6603(a), Table 2d(4)(c)]
d. During periods of startup, minimize the engine's time spent at idle and minimize the engine's startup time at startup to a period needed for appropriate and safe loading of the engine, not to exceed 30 minutes, after which time the non-startup emission limitations apply; and [40 CFR 63. 6603(a), Table 2d]
e. The permittee must install a non-resettable hour meter on each emergency stationary RICE, if one is not already installed. [40 CFR 63.6625(f)]

1.8. Operating Conditions for Emergency Stationary RICE

The permittee must operate any emergency stationary RICE in compliance with the following conditions: [40 CFR 63.6640(f)]

a. There is no time limit on the use of emergency stationary RICE in emergency situations.

b. Emergency stationary RICE may be operated for the purpose of maintenance checks and readiness testing, provided that the tests are recommended by the manufacturer, the vendor, or the insurance company associated with the engine. Required maintenance and testing of such units is limited to 50 hours per year.

c. The permittee is prohibited from using its emergency stationary RICE for any non-emergency use including but not limited to peak shaving, demand response operation, and/or generation of income from the sale of power. To perform such activity the permittee must first obtain a modified permit in accordance with Condition 7.2 or a separate permit for power generation that appropriately addresses and allows this activity.

1.9. Operating Conditions for Emergency Stationary RICE The permittee must keep records of the hours of operation of each emergency stationary RICE that is recorded through the non-resettable hour meter. The permittee must document how many hours are spent for emergency operation; including what classified the operation as emergency and how many hours are spent for non-emergency operation used for maintenance checks and readiness testing. [40 CFR 63.6655(f)]

2.0 SPECIFIC PERFORMANCE AND EMISSION STANDARDS

2.1. Concrete Crusher Engine If the permittee installs a diesel engine to power a concrete crusher, the engine must comply with the New Source Performance Standards (NSPS) for Compression Ignition Internal Combustion Engines (40 CFR 60, Subpart IIII). This regulation includes the requirement for engines with a maximum engine power greater than or equal to 56 kW and less than 130 kW to meet the applicable requirements for 2012 and later model year non-emergency engines. [40 CFR 60.4208(d)] If a third party is contracted to conduct concrete crushing, the third party may have the applicable requirements in their portable permit.

3.0 PLANT SITE EMISSION LIMITS

3.1. Plant Site Emission Limits (PSEL) The permittee must not cause or allow plant site emissions to exceed the following:

Pollutant	Limit	Units
PM	24	tons per year
PM_{10}	14	tons per year
$PM_{2.5}$	9	tons per year
SO_2	39	tons per year
NO_x	39	tons per year
CO	99	tons per year
VOC	39	tons per year
GHGs (CO_2e)	74,000	tons per year

3.2. Annual Period The annual plant site emission limits apply to any 12-consecutive calendar month period.

4.0 COMPLIANCE DEMONSTRATION AND SOURCE TESTING

4.1. Monitoring Requirements The permittee must monitor the operation and maintenance of the organic recovery unit and thermal oxidizer. The temperature of the thermal oxidizer must be continuously monitored and recorded at least every 15 minutes of operation. The operator shall be notified of any flame failure.

4.2. PSEL Compliance Monitoring The permittee must demonstrate compliance with the PSEL for each 12-consecutive calendar month period based on the following calculation for each pollutant except GHGs:

$$E = \Sigma(EF \times P)/2000 \text{ lbs}$$

Where:

E = pollutant emissions (ton/yr);
EF = pollutant emission factor (see Condition 11.0);
P = process production (see Condition 12.0)

4.3. Emission Factors The permittee must use the default emission factors provided in Condition 11.0 for calculating pollutant emissions, unless alternative emission factors are approved in writing by DEQ. The permittee may request or DEQ may require using alternative emission factors provided they are based on actual test data or other documentation (e.g., AP-42 compilation of emission factors) that has been reviewed and approved by DEQ.

5.0 RECORDKEEPING REQUIREMENTS

5.1. Operation and Maintenance The permittee must maintain the following records related to the operation and maintenance of the plant and associated air contaminant control devices:

a. Amount of propane fed to the thermal oxidizer (TOU-1), gallons.
b. Amount of material processed through the stabilization, solidification, micro-encapsulation, macro-encapsulation, and bioremediation units, tons.
c. Amount of propane fed to the Organic Recovery Unit (ORU), gallons
d. Amount of landfill gas fed to the Organic Recovery Unit (ORU), $MMft^3$.
e. Miles traveled on unpaved roads, VMT.
f. Amount of cover soil moved, tons.
g. Temperature of thermal oxidizer, °F.
h. If used oil is used as fuel, the permittee must obtain analyses from the marketer or, if generated on site, have the used oil analyzed, so that it can be demonstrated that the used oil does not exceed the used oil specifications contained in 40 CFR Part 279.11, Table 1.

5.2. Excess Emissions The permittee must maintain records of excess emissions as defined in OAR 340-214-0300 through 340-214-0340 (recorded on occurrence). Typically, excess emissions are caused by process upsets, startups, shutdowns or scheduled maintenance. In many cases, excess emissions are evident when visible emissions are greater than 20% opacity as a six-minute block average. If there is an ongoing excess emission caused by an upset or breakdown, the permittee must cease operation of the equipment or facility no later than 48 hours after the beginning of the excess emissions, unless continued operation is approved by DEQ in accordance with OAR 340-214-0330(4).

5.3. Complaint Log The permittee must maintain a log of all written complaints and complaints received via telephone that specifically refer to air pollution concerns associated to the permitted facility. The log must include a record of the permittee's actions to investigate the validity of each complaint and a record of actions taken for complaint resolution.

5.4. Retention of Records Unless otherwise specified, the permittee must retain all records for a period of at least five (5) years from the date of the monitoring sample, measurement, report or application and make them available to DEQ upon request. The permittee must maintain the two (2) most recent years of records onsite.

6.0 REPORTING REQUIREMENTS

6.1. Excess Emissions

The permittee must notify DEQ of excess emissions events if the excess emission is of a nature that could endanger public health.

a. Such notice must be provided as soon as possible, but never more than one hour after becoming aware of the problem. Notice must be made to the regional office identified in Condition 9.0 by e-mail, telephone, facsimile, or in person.
b. If the excess emissions occur during non-business hours, the permittee must notify DEQ by calling the Oregon Emergency Response System (OERS). The current number is 1-800-452-0311.
c. The permittee must also submit follow-up reports when required by DEQ.

6.2. Annual Report

For each year this permit is in effect, the permittee must submit to DEQ by **February 15** two (2) copies of the following information for the previous calendar year:

a. Operating parameters:
   i. Amount of propane burned in the thermal oxidizer each month;
   ii. Amount of propane and landfill gas burned in the ORU each month;
   iii. Amount of material processed through the stabilization, solidification, micro-encapsulation, macro-encapsulation, and bioremediation units each month;
   iv. Estimate the amount of vehicle miles traveled on unpaved roads each month.
b. A summary of annual pollutant emissions determined each month in accordance with Condition 4.0.
c. Records of all planned and unplanned excess emissions events.
d. Summary of complaints relating to air quality received by permittee during the year.
e. List permanent changes made in plant process, production levels, and pollution control equipment which affected air contaminant emissions.
f. List of major maintenance performed on pollution control equipment.

6.3. Greenhouse Gas Registration and Reporting

If the calendar year emission rate of greenhouse gases (CO_2e) is greater than or equal to 2,756 tons (2,500 metric tons), the permittee must register and report its greenhouse gas emissions with DEQ in accordance with OAR 340-215.

6.4.	**Notice of Change of Ownership or Company Name**	The permittee must notify DEQ in writing using a Departmental "Transfer Application" form within 60 days after the following: a. Legal change of the name of the company as registered with the Corporations Division of the State of Oregon; or b. Sale or exchange of the activity or facility.
6.5.	**Construction or Modification Notices**	The permittee must notify DEQ in writing using a Departmental "Notice of Intent to Construct" form, or other permit application forms and obtain approval in accordance with OAR 340-210-0205 through 340-210-0250 before: a. Constructing, installing or establishing a new stationary source that will cause an increase in any regulated pollutant emissions; b. Making any physical change or change in operation of an existing stationary source that will cause an increase, on an hourly basis at full production, in any regulated pollutant emissions; or c. Constructing or modifying any air pollution control equipment.

7.0 ADMINISTRATIVE REQUIREMENTS

7.1.	**Permit Renewal Application**	The permittee must submit the completed application package for renewal of this permit by October 1, 2018. The permittee must submit two (2) copies of the application to the DEQ Permit Coordinator listed in Condition 9.2.
7.2.	**Permit Modifications**	The permittee must submit an application for a modification of this permit not less than **60** days prior to the source modification. A special activity fee must be submitted with an application for the permit modification. The fees and two (2) copies of the application must be submitted to the Business Office of DEQ.

8.0 FEES

8.1.	**Annual Compliance Fee**	The permittee must pay the Annual Fee specified in OAR 340-216-8020, Table 2, Part 2 for a Simple ACDP by **December 1** of each year this permit is in effect. An invoice indicating the amount, as determined by DEQ regulations, will be mailed prior to the above date. **Late fees in accordance with Part 4 of the table will be assessed as appropriate.**
8.2.	**Change of Ownership or Company Name Fee**	The permittee must pay the non-technical permit modification fee specified in OAR 340-216-8020, Table 2, Part 3(a) with an application for changing the ownership or the name of the company.

8.3. Special Activity Fees The permittee must pay the special activity fees specified in OAR 340-216-8020, Table 2, Part 3 (b through k) with an application to modify the permit.

9.0 DEQ CONTACTS / ADDRESSES

9.1. Business Office The permittee must submit payments for invoices, applications to modify the permit, and any other payments to DEQ's Business Office:

Department of Environmental Quality
Accounting / Revenue
811 SW Sixth Avenue
Portland, OR 97204-1390

9.2. Permit Coordinator The permittee must submit all Notices and applications that do not include payment to the Eastern Region's Permit Coordinator:

Eastern Region - Bend Office
475 NE Bellevue Dr., Suite 110
Bend, OR 97701
541-388-6146

9.3. Report Submittals Unless otherwise notified, the permittee must submit all reports (annual reports, source test plans and reports, etc.) to DEQ's Eastern Region. If you know the name of the Air Quality staff member responsible for your permit, please include it.

Eastern Region – Bend Office
475 NE Bellevue Dr., Suite 110
Bend, OR 97701
541-388-6146

9.4. Permit Writer/ Inspector The permit writer/inspector can be reached at the following office:

Eastern Region – Pendleton Office
800 SE Emigrant Avenue, Suite 330
Pendleton, OR 97801-2597
541-276-4063

9.5. Website Information about air quality permits and DEQ's regulations may be obtained from the DEQ web page at www.oregon.gov/DEQ.

10.0 GENERAL CONDITIONS AND DISCLAIMERS

10.1. Permitted Activities This permit allows the permittee to discharge air contaminants from processes and activities related to the air contaminant source(s) listed on the first page of this permit until this permit expires, is modified, or is revoked.

10.2. Other Regulations In addition to the specific requirements listed in this permit, the permittee must comply with all other legal requirements enforceable by DEQ.

10.3. Conflicting Conditions In any instance in which there is an apparent conflict relative to conditions in this permit, the most stringent conditions apply.

10.4. Masking of Emissions The permittee must not cause or permit the installation of any device or use any means designed to mask the emissions of an air contaminant that causes or is likely to cause detriment to health, safety, or welfare of any person or otherwise violate any other regulation or requirement.

10.5. DEQ Access The permittee must allow DEQ's representatives access to the plant site and pertinent records at all reasonable times for the purposes of performing inspections, surveys, collecting samples, obtaining data, reviewing and copying air contaminant emissions discharge records and conducting all necessary functions related to this permit in accordance with ORS 468-095.

10.6. Permit Availability The permittee must have a copy of the permit available at the facility at all times.

10.7. Open Burning The permittee may not conduct any open burning except as allowed by OAR 340, division 264.

10.8. Asbestos The permittee must comply with the asbestos abatement requirements in OAR 340, Division 248 for all activities involving asbestos-containing materials, including, but not limited to, demolition, renovation, repair, construction, and maintenance.

10.9. Property Rights The issuance of this permit does not convey any property rights in either real or personal property, or any exclusive privileges, nor does it authorize any injury to private property or any invasion of personal rights, nor any infringement of federal, state, or local laws or regulations.

10.10. Permit Expiration

a. A source may not be operated after the expiration date of the permit, unless any of the following occur prior to the expiration date of the permit:
   i. A timely and complete application for renewal or for an Oregon Title V Operating Permit has been submitted, or
   ii. Another type of permit (ACDP or Oregon Title V Operating Permit) has been issued authorizing operation of the source.

b. For a source operating under an ACDP or Oregon Title V Operating Permit, a requirement established in an earlier ACDP remains in effect notwithstanding expiration of the ACDP, unless the provision expires by its terms or unless the provision is modified or terminated according to the procedures used to establish the requirement initially.

10.11. Permit Termination, Revocation, or Modification DEQ may modify or revoke this permit pursuant to OAR 340-216-0082 and 340-216-0084.

11.0 EMISSION FACTORS

Emissions Device or Activity	Pollutant	Emission Factor (EF)	EF Units	EF Reference
Thermal Oxidizer (TOU-1)	$PM/PM_{10}/PM_{2.5}$	0.7	lb/Mgal	AP-42 Table 1.5-1
	SO_2	11.22	lb/Mgal	AP-42 Table 1.5-1
	NO_X	13	lb/Mgal	AP-42 Table 1.5-1
	CO	7.5	lb/Mgal	AP-42 Table 1.5-1
	VOC	1.0	lb/Mgal	AP-42 Table 1.5-1
Organic Recovery Unit (ORU) Propane	$PM/PM_{10}/PM_{2.5}$	0.7	lb/Mgal	AP-42 Table 1.5-1
	SO_2	11.22	lb/Mgal	AP-42 Table 1.5-1
	NO_X	13	lb/Mgal	AP-42 Table 1.5-1
	CO	7.5	lb/Mgal	AP-42 Table 1.5-1
	VOC	0.8	lb/Mgal	AP-42 Table 1.5-1
Organic Recovery Unit (ORU) Landfill Gas	$PM/PM_{10}/PM_{2.5}$	9.35	lb/MMdscf	AP-42 Table 2.4-5
	SO_2	49.9	lb/MMdscf	Source Estimate
	NO_X	37.4	lb/MMdscf	AP-42 Table 2.4-4
	CO	170.5	lb/MMdscf	AP-42 Table 13.5-2
	VOC	77	lb/MMdscf	AP-42 Table 13.5-1
ORU Boiler (ME-1902)	$PM/PM_{10}/PM_{2.5}$	0.7	lb/Mgal	AP-42 Table 1.5-1
	SO_2	11.22	lb/Mgal	AP-42 Table 1.5-1
	NO_X	13	lb/Mgal	AP-42 Table 1.5-1
	CO	7.5	lb/Mgal	AP-42 Table 1.5-1
	VOC	1.0	lb/Mgal	AP-42 Table 1.5-1
Concrete Crusher Engine	$PM/PM_{10}/PM_{2.5}$	2.2E-03	lb/hp-hr	AP-42 Section 3.3
	SO_2	2.05E-03	lb/hp-hr	AP-42 Section 3.3
	NO_X	3.1E-02	lb/hp-hr	AP-42 Section 3.3
	CO	6.68E-03	lb/hp-hr	AP-42 Section 3.3
	VOC	2.47E-03	lb/hp-hr	AP-42 Section 3.3
Waste Oil Heater	PM	3.3	lb/Mgal	AP-42 Section 11.1
	$PM_{10}/PM_{2.5}$	2.85	lb/Mgal	AP-42 Section 11.1
	SO_2	214	lb/Mgal	AP-42 Table 1.11-2
	NO_X	16	lb/Mgal	AP-42 Table 1.11-2
	CO	2.1	lb/Mgal	AP-42 Table 1.11-2
	VOC	1.0	lb/Mgal	AP-42 Table 1.11-2

Emissions Device or Activity	Pollutant	Emission Factor (EF)	EF Units	EF Reference
Stabilization	PM	1.36E-04	lb/ton	AP-42 Section 13.2.4
	PM_{10}	6.45E-05	lb/ton	AP-42 Section 13.2.4
	$PM_{2.5}$	9.77E-06	lb/ton	AP-42 Section 13.2.4
Solidification	PM	0.12	lb/ton	AP-42 Equation 11.12-1
	PM_{10}	0.04	lb/ton	AP-42 Equation 11.12-1
	$PM_{2.5}$	1.29E-05	lb/ton	AP-42 Equation 11.12-1
Micro-Encapsulation	PM	0.143	lb/ton	Source Estimate
	PM_{10}	0.045	lb/ton	Source Estimate
	$PM_{2.5}$	0.00001	lb/ton	Source Estimate
Macro-Encapsulation	PM	0.13	lb/ton	Source Estimate
	PM_{10}	0.0587	lb/ton	Source Estimate
	$PM_{2.5}$	0.00001	lb/ton	Source Estimate
Unpaved Roads	PM	1.31	lb/VMT	AP-42 Section 13.2.2
	PM_{10}	0.35	lb/VMT	AP-42 Section 13.2.2
	$PM_{2.5}$	0.04	lb/VMT	AP-42 Section 13.2.2
Cover Soil	PM	0.118	lb/ton	AP-42 Section 11.9
	PM_{10}	0.095	lb/ton	AP-42 Section 11.9
	$PM_{2.5}$	0.034	lb/ton	AP-42 Section 11.9

12.0 PROCESS/PRODUCTION RECORDS

Emissions Device or Activity	Process or Production Parameter	Frequency
Thermal Oxidizer (TOU-1)	1000 Gallons Propane	Monthly
Organic Recovery Unit (ORU)	1000 Gallons Propane MMdscf Landfill Gas	Monthly
ORU Boiler (ME-1902)	1000 Gallons Propane	Monthly
Concrete Crusher Engine	hp-hr	Monthly
Waste Oil Heater	1000 Gallons Waste Oil	Monthly
Stabilization, Solidification, Micro-Encapsulation, Macro-Encapsulation, Cover Soil	Tons Material	Monthly
Travel on Unpaved Roads	VMT	Monthly

13.0 ABBREVIATIONS, ACRONYMS AND DEFINITIONS

ACDP	Air Contaminant Discharge Permit
ASTM	American Society for Testing and Materials
CFR	Code of Federal Regulations
CO	Carbon Monoxide
CO_2e	Carbon Dioxide Equivalent
DEQ	Oregon Department of Environmental Quality
dscf	dry standard cubic foot
EPA	US Environmental Protection Agency
Gal	Gallon(s)
GHG	Greenhouse Gas
gr/dscf	grains per dry standard cubic foot
HAP	Hazardous Air Pollutant as defined by OAR 340-244-0040
lb	Pound(s)
LFG	Landfill Gas
MMBtu	Million British thermal units
NA	Not Applicable
NESHAP	National Emissions Standards for Hazardous Air Pollutants
NO_X	Nitrogen Oxides
NSPS	New Source Performance Standard
NSR	New Source Review
O_2	Oxygen
OAR	Oregon Administrative Rules
ORS	Oregon Revised Statutes
O&M	Operation and Maintenance
Pb	Lead
PCD	Pollution Control Device
PM	Particulate Matter
PM_{10}	Particulate Matter less than 10 microns in size
$PM_{2.5}$	Particulate Matter less than 2.5 microns in size
ppm	part per million
PSD	Prevention of Significant Deterioration
PSEL	Plant Site Emission Limit
RACT	Reasonably Available Control Technology
scf	standard cubic foot
SER	Significant Emission Rate
SIC	Standard Industrial Code
SIP	State Implementation Plan
SO_2	Sulfur Dioxide
Special Control Area	as defined in OAR 340-204-0070
VE	Visible Emissions
VMT	Vehicle Mile Traveled
VOC	Volatile Organic Compound
year	A period consisting of any 12-consecutive calendar months

State of Oregon
Department of Environmental Quality

SIMPLE AIR CONTAMINANT DISCHARGE PERMIT REVIEW REPORT

Department of Environmental Quality
Eastern Region

Source Information:

SIC	4953
NAICS	562211

Source Categories (Table 1 Part, code)	B,85
Public Notice Category	I

Compliance and Emissions Monitoring Requirements:

FCE	No
Compliance schedule	No
Unassigned emissions	No
Emission credits	No
Special Conditions	No

Source test [date(s)]	No
COMS	No
CEMS	No
PEMS	No
Ambient monitoring	No

Reporting Requirements

Annual report (due date)	2/15
Quarterly report (due dates)	No

Monthly report (due dates)	No
Excess emissions report	No
Other (specify)	No

Air Programs

Synthetic Minor (SM)	No
SM -80	No
NSPS (list subparts)	IIII
NESHAP (list subparts)	ZZZZ
Part 68 Risk Management	No
CFC	No

NSR	No
PSD	No
RACT	No
TACT	X
Other (specify)	No

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PERMITTING

PERMITTEE IDENTIFICATION

1. Chemical Waste Management of the Northwest, Inc. operates a hazardous waste and polychlorinated biphenyl (PCB) treatment, storage, and disposal facility about 12 miles south-southwest of Arlington.

PERMITTING ACTION

2. The proposed permit is a modification of an existing Air Contaminant Discharge Permit (ACDP) that was issued on 2/7/2014 is scheduled to expire on 2/1/2019.

OTHER PERMITS

3. Other permits issued or required by the DEQ for this source include a Hazardous Waste Treatment Storage and Disposal Permit ORD089452353 and a NPDES Storm Water Permit 100043.

ATTAINMENT STATUS

4. The source is located in an attainment area for all pollutants.

5. The source is not located within 10 kilometers of any Class I Air Quality Protection Area.

SOURCE DESCRIPTION

OVERVIEW

6. The permittee operates a hazardous waste and PCB treatment, storage and disposal facility. The facility began accepting waste about 1977.

7. The following changes have been made to the facility since the last permit renewal:

   a. The permittee has proposed to supplement the indirect heating of the ORU using treated landfill gas generated at the adjacent Columbia Ridge Landfill and Recycling Center. Currently the 30 MMBtu/hr burners of the ORU are fueled by propane only. The burners will be allowed to combust propane, landfill gas, or any combination of the two fuels.
   b. A new 6 MMBtu/hr thermal oxidizer has been proposed to replace the existing elevated enclosed flare on the ORU.

c. Several above-ground storage tanks associated with the ORU are being added to the inventory of tanks at the facility. These 20 new tanks have a capacity of 20,000 gallons or less and are not subject to the New Source Performance Standards (NSPS) for Volatile Organic Liquid Storage Vessels (Subpart Kb). Due to the vapor pressure of the liquids stored in these tanks, emissions from these units are considered to have de-minimus emissions.
d. A system for collecting vapor from the waste feed hopper and conveyors will be installed on the ORU. The vapors will be routed to the thermal oxidizer.
e. A series of heat exchangers, cooling towers, carbon and sand filters, and pumping systems will be installed on the ORU. These systems are sealed units used to process liquids and will not vent to the atmosphere.
f. New fuel storage tanks for propane and landfill gas used to heat the ORU will be installed.
g. A new propane-fired 1.046 MMBtu/hr boiler will be installed.
h. A new emergency 600 bhp generator will provide backup power in case of emergencies.

<u>PROCESS AND CONTROL DEVICES</u>

8. Hazardous waste is received packaged in according to U.S. Dept. of Transportation standards. Containers are temporarily stored to allow for sampling and waste conformance before processing. Wastes that are similar may be stored in approved areas to facility on-site treatment or subsequent treatment off-site.

  a. **Bulk Storage:** Bulk materials received by the facility are stored in bulk storage buildings B-1, B-2, B-4 and B-5. These buildings operate under negative pressure to prevent fugitives and vent through baghouses that have a 98% control efficiency.
  b. **Solidification** involves treatment of liquids and semi-solids with reagents that form a solid material and does not necessarily involve a chemical reaction between the contaminants and the solidifying reagents. Contaminant migration is thus restricted. The process takes place outdoors, but the material is wet which suppresses fugitive dust emissions. Emissions are uncontrolled.
  c. **Stabilization/Encapsulation** involves treatment with reagents that chemically reduce the hazard potential of waste by converting the contaminants into less soluble, mobile or toxic forms. Macro encapsulation also includes the use of a high density polyethylene (HDPE) vault to encapsulate the waste that has been mixed with the stabilization agent. Stabilization is performed outdoors. Water may be added to mitigate fugitive dust emissions.
  d. **Solar Evaporation Impoundments:** Aqueous liquid wastes are placed into a surface impoundment for evaporation. These wastes have been treated in the Wastewater Treatment Unit or otherwise treated to meet RCRA standards. These units are insignificant sources of volatile compounds.

e. **Bioremediation** relies on micro-organisms such as bacteria or fungi to transform hazardous chemicals (petroleum hydrocarbons, nitroaromatics and nitroamines, chlorinated pesticides and other select organics) into less toxic or non-toxic substances. Bioremediation activities occur in building B-5, which employs a baghouse for dust control.

f. **Landfilling Operation:** The wastes disposed of on-site are previously treated or treated on-site to meet the stringent standards for disposal under the RCRA regulations. Due to the RCRA pre-treatment requirements, the wastes placed in the landfill organic emissions from the landfill are insignificant. A limited amount of cover soil is used during the landfilling activities which produce some particulate emissions.

g. **Organic Recovery Unit (ORU):** The organic recovery unit was originally constructed in 2008 and will be modified with this permit modification. The ORU physically treats soil or other media contaminated with petroleum products or other organics. The organics are thermally desorbed from the media at low temperatures using indirect heat. The media is cooled, moisturized and tested for compliance with RCRA requirements before being landfilled. The organic vapors are condensed with the resulting liquid being recycled or treated prior to disposal. Any residual non-condensable gas is destroyed in a thermal oxidizer.

COMPLIANCE

9. The facility was inspected on 10/29/2012 and found to be out of compliance with permit conditions for failure to properly monitor operation of the ORU. This was also a violation of conditions in the Hazardous Waste Permit. The Air Quality Program did not refer this violation for enforcement since it was referred by the Hazardous Waste Program. On 1/23/2013 an $18,400 civil penalty was assessed for the violation. Conditions which led to the violation have since been corrected.

10. During the prior permit period there were no, complaints recorded for this facility.

EMISSIONS

11. Proposed PSEL information:

Pollutant	Baseline Emission Rate (tons/yr)	Netting Basis		Plant Site Emission Limits (PSEL)		
		Previous (tons/yr)	Proposed (tons/yr)	Previous PSEL (tons/yr)	Proposed PSEL (tons/yr)	PSEL Increase (tons/yr)
PM	0	0	0	24	24	0
PM_{10}	0	0	0	14	14	0
$PM_{2.5}$	0	0	0	9	9	0
SO_2	0	0	0	39	39	0
NO_x	0	0	0	39	39	0
CO	0	0	0	99	99	0
VOC	0	0	0	39	39	0
GHG (CO_2e)	0	0	0	74,000	74,000	0

a. The netting basis is zero for Simple ACDPs in accordance with OAR 340-222-0040(3).
b. The previous PSEL is the PSEL in the last permit.
c. For Simple ACDPs, The proposed PSELs for all pollutants are equal to the Generic PSEL in accordance with OAR 340-216-0064(3)(b). The actual emissions are calculated in the Detail Sheets attached to this Review Report.
d. The PSEL is a federally enforceable limit on the potential to emit.

SIGNIFICANT EMISSION RATE ANALYSIS

12. For each pollutant, the proposed Plant Site Emission Limit is less than the Netting Basis plus the significant emission rate, thus no further air quality analysis is required.

13. An analysis of the proposed PSEL increases over the Netting Basis is shown in the following table.

Pollutant	SER	Requested Increase Over Previous Netting Basis	Increase Due to Utilizing Capacity that Existed in Baseline Period	Increase Due to Physical Changes or Changes in Method of Operation	Increase Due to Changes to Rules (i.e., the Generic PSEL)
PM	25	24	0	13	11
PM_{10}	15	14	0	6	8
$PM_{2.5}$	10	9	0	3	6
SO_2	40	39	0	12	27
NO_x	40	39	0	23	16
CO	100	99	0	30	69
VOC	40	39	0	15	24
GHG (CO_2e)	75,000	74,000	0	27,480	46,520

TITLE V MAJOR SOURCE APPLICABILITY

14. A major source is a facility that has the potential to emit 100 tons/yr or more of any criteria pollutant or 10 tons/yr or more of any single HAP or 25 tons/yr or more of combined HAPs. This facility is not a major source of emissions. The basis for this determination can be found in the Detail Sheets attached to this Review Report.

ADDITIONAL REQUIREMENTS

<u>NSPS APPLICABILITY</u>

15. The New Source Performance Standards (NSPS) for boilers (Subparts D, Da, Db, and Dc) do not apply to the new boiler (unit ME-1902) because the rated design heat capacity for this boiler is 1.046 MMBtu/hr which is less than the minimum 10 MMBtu/hr regulated by these standards.

16. The permittee may either contract with a third party to operate a concrete crusher on-site or install its own concrete crusher. If a third party is used, they should have any applicable permits from DEQ. If the permittee decides to install and operate their own concrete crusher they may be subject to some additional regulations. The concrete crusher would not be subject to the NSPS for nonmetallic mineral processing plants (Subpart OOO) because concrete does not fit the definition of nonmetallic minerals (40 CFR 60.671).

17. A diesel engine may be used to power the concrete crushing operation or to provide backup power to the facility in case of emergencies. These engines would be subject to the NSPS for Stationary Compression Ignition Internal Combustion Engines (Subpart IIII). The engine supporting concrete crushing would be approximately 100 kW in size and have a displacement of less than 30 liters per cylinder. This engine must be certified to meet the emission standards applicable for the model year. [40 CFR 60.4204(b)]

    The emergency generator is rated at 600 bhp (447 kW) and must also be certified to meet the emission standards applicable for the model year. [40 CFR 60.4205(b)]

<u>NESHAPS/MACT APPLICABILITY</u>

18. The National Emission Standard for Hazardous Air Pollutants (NESHAP) for boilers at area sources of HAP emissions (Subpart JJJJJJ) does not apply to the new boiler (unit ME-1902) because gas-fired units (including propane gas) are exempt from this regulation. [40 CFR 63.11195(e)]

19. The NESHAP for Stationary Reciprocating Internal Combustion Engines (Subpart ZZZZ) is applicable to the emergency generator and concrete crusher engines. Both engines would be considered new (commenced construction after 6/12/2006). As new engines located at an area source of HAP emissions the NESHAP requirements are met by meeting the requirements of NSPS Subpart IIII. No further NESHAP requirements under Subpart ZZZZ are applicable. [40 CFR 63.6590(c)]

RACT APPLICABILITY

20. The RACT rules are not applicable to this source because it is not in the Portland AQMA, Medford AQMA, or Salem SKATS.

TACT APPLICABILITY

21. The source is meeting the states TACT/Highest and Best Rules by monitoring the temperature of the organic recovery unit and thermal oxidizer.

PUBLIC NOTICE

22. Pursuant to OAR 340-216-0064(4)(b)(A), a simple technical permit modification of a Simple Air Contaminant Discharge Permit requires no prior public notice or opportunity for participation in accordance with OAR 340-209-0030(3)(a). However, DEQ will maintain a list of all simple technical permit modifications and make the list available for public review.

DW:ww

ATTACHMENT A: DETAIL SHEETS

Particulate

Emission Point	Operating Parameters		Emission Factor			ton/yr
			Rate		Reference	
Stabilization	45,000	ton/yr	1.36E-04	lb/ton[a]	AP-42 Section 13.2.4	0.003
Solidification	12,000	ton/yr	0.120	lb/ton[b]	AP-42 Eq 11.12-1	0.72
Micro Encapsulation	2,500	ton/yr	0.143	lb/ton	Source Estimate	0.18
Macro Encapsulation	8,000	ton/yr	0.13	lb/ton	Source Estimate	0.52
Rock Crusher-Building B1	78,000	ton/yr	1.08E-04	lb/ton[c]	AP-42 Table 11.19.2-2	0.004
Building B4	15,000	ton/yr	9.24E-07	lb/ton[d]	AP-42 Section13.2.4	6.93E-06
Bioremediation/ORU Storage Building B5	438,000	ton/yr	1.02E-08	lb/ton[e]	AP-42 Section13.2.4	2.23E-06
Propane (ORU)	1,500	Mgal/yr	0.7	lb/Mgal	AP-42 Table 1.5-1	0.53
LFG (ORU)	245.46	MMdscf/yr[f]	9.35	lb/MMdscf	AP-42 Table 2.4-4	1.15
Thermal Oxidizer (TOU-1)	714	Mgal/yr	0.7	lb/MMdscf[g]	AP-42 Table 1.5-1	0.25
ORU Discharge (V-1503)	438,000	ton/yr	2.56E-07	lb/ton[h]	AP-42 Section 13.2.4	5.61E-05
ORU Boiler (ME-1902)	100.69	Mgal/yr	0.7	lb/Mgal	AP-42 Table 1.5-1	3.52E-02
Unpaved Roads	12,480	VMT/yr	1.31	lb/VMT[i]	AP-42 Section 13.2.2	8.2
Cover Soil	20,000	ton/yr	0.118	lb/ton[j]	AP-42 Section 11.9	1.2
Material Transfer-Offload	100,000	ton/yr	1.46E-04	lb/ton	AP-42 Section 13.2.4	0.007
Reagent Transfer	100,000	ton/yr	1.46E-04	lb/ton	AP-42 Section 13.2.4	0.007
Concrete Crushing	78,000	ton/yr	1.46E-03	lb/ton[k]	AP-42 Section 11.19.2	0.06
Generator	209,196	hp-hr/yr[l]	0.0022	lb/hp-hr	AP-42 Section 3.3	0.2
Waste Oil Heater	2,200	gal/yr	3.3	lb/Mgal	AP-42 Section 1.11-1	0.004
Propane Heater	1,400	gal/yr	0.7	lb/Mgal	AP-42 Section 1.5-1	0.0005
Total Particulate Emissions						**13.07**

a. Assumes 7 mph wind and 21% moisture
b. Assumes 7 mph wind and 60% moisture
c. Assumes baghouse control of 98%
d. Assumes 0.001 mph wind (inside building) and 0.2% moisture
e. Assumes 0.001 mph wind (inside building) and 5% moisture
f. 467 cfm of LFG flow for 8760 hr/yr, emission factor 17 lb/MMdscf methane, LFG is 55% methane
g. Assumes both fume and pilot emissions similar to propane emissions
h. Assumes 0.001 mph wind (inside building), 0.5% moisture, 98% control (BH)
i. Assumes 80% control of particulate due to watering
j. Combination of activities: bulldozing (AP-42 Table 11.9-1, 7% silt, 20% moisture, 32 ton/day, 10 hr/day)+scraper removing topsoil (AP-42 Table 11.9-4)+unload topsoil (AP-42 Table 11.9-4), 75% control
k. Combination of activities: controlled emissions for truck unload, transfer to crusher, tertiary crushing, and truck load
l. Assumes 100 kW (134.1 hp) diesel engine operating 1560 hr/yr.

PM_{10}

Emission Point	Operating Parameters		Emission Factor			ton/yr
			Rate		Reference	
Stabilization	45,000	ton/yr	6.45E-05	lb/ton[a]	AP-42 Section 13.2.4	0.001
Solidification	12,000	ton/yr	0.040	lb/ton[b]	AP-42 Eq 11.12-1	0.24
Micro Encapsulation	2,500	ton/yr	0.045	lb/ton	Source Estimate	0.06
Macro Encapsulation	8,000	ton/yr	0.0587	lb/ton	Source Estimate	0.23
Rock Crusher-Building B1	78,000	ton/yr	4.80E-05	lb/ton[c]	AP-42 Table 11.19.2-2	0.002
Building B4	15,000	ton/yr	4.37E-07	lb/ton[d]	AP-42 Section13.2.4	3.28E-06
Bioremediation/ORU storage Building B5	438,000	ton/yr	4.82E-09	lb/ton[e]	AP-42 Section13.2.4	1.06E-06
Propane (ORU)	1,500	Mgal/yr	0.7	lb/Mgal	AP-42 Table 1.5-1	0.53
LFG (ORU)	245.46	MMdscf/yr[f]	9.35	lb/MMdscf	AP-42 Table 2.4-5	1.15
Thermal Oxidizer (TOU-1)	714.223	Mgal/yr	0.7	lb/MMdscf[g]	AP-42 Table 1.5-1	0.25
ORU Discharge (V-1503)	438,000	ton/yr	2.42E-09	lb/ton[h]	AP-42 Section 13.2.4	5.31E-07
ORU Boiler (ME-1902)	100,690	gal/yr	0.7	lb/Mgal	AP-42 Table 1.5-1	3.52E-02
Unpaved Roads	12,480	VMT/yr	0.35	lb/VMT[i]	AP-42 Section 13.2.2	2.2
Cover Soil	20,000	ton/yr	0.095	lb/ton[j]	AP-42 Section 11.9	0.9
Material Transfer-Offload	100,000	ton/yr	6.91E-05	lb/ton	AP-42 Section 13.2.4	0.003
Reagent Transfer	100,000	ton/yr	6.91E-05	lb/ton	AP-42 Section 13.2.4	0.003
Concrete Crushing	78,000	ton/yr	7.02E-04	lb/ton[k]	AP-42 Section 11.19.2	0.03
Generator	209,196	hp-hr/yr[l]	0.0022	lb/hp-hr	AP-42 Section 3.3	0.2
Waste Oil Heater	2,200	gal/yr	2.85	lb/Mgal	AP-42 Section 1.11-1	3.14E-03
Propane Heater	1,400	gal/yr	0.7	lb/Mgal	AP-42 Section 1.5-1	4.90E-04
Total PM_{10} Emissions						**5.92**

a. Assumes 7 mph wind and 21% moisture
b. Assumes 7 mph wind and 60% moisture
c. Assumes baghouse control of 98%
d. Assumes 0.001 mph wind (inside building) and 0.2% moisture
e. Assumes 0.001 mph wind (inside building) and 5% moisture
f. 467 cfm of LFG flow for 8760 hr/yr, emission factor 17 lb/MMdscf methane, LFG is 55% methane
g. Assumes both fume and pilot emissions similar to propane emissions
h. Assumes 0.001 mph wind (inside building), 0.5% moisture, 98% control (BH)
i. Assumes 80% control of particulate due to watering
j. Combination of activities: bulldozing (AP-42 Table 11.9-1, 7% silt, 20% moisture, 32 ton/day, 10 hr/day)+scraper removing topsoil (AP-42 Table 11.9-4)+unload topsoil (AP-42 Table 11.9-4), 75% control
k. Combination of activities: controlled emissions for truck unload, transfer to crusher, tertiary crushing, and truck load
l. Assumes 100 kW (134.1 hp) diesel engine operating 1560 hr/yr.

$PM_{2.5}$

Emission Point	Operating Parameters		Emission Factor			ton/yr
			Rate		Reference	
Stabilization	45,000	ton/yr	9.77E-06	lb/ton[a]	AP-42 Section 13.2.4	0.0002
Solidification	12,000	ton/yr	1.29E-05	lb/ton[b]	AP-42 Eq 11.12-1	0.0001
Micro Encapsulation	2,500	ton/yr	0.00001	lb/ton	Source Estimate	1.25E-05
Macro Encapsulation	8,000	ton/yr	0.00001	lb/ton	Source Estimate	4.00E-05
Rock Crusher-Building B1	78,000	ton/yr	1.30E-05	lb/ton	AP-42 Table 11.19.2-2	0.001
Building B4	15,000	ton/yr	6.62E-08	lb/ton[c]	AP-42 Section13.2.4	4.96E-07
Bioremediation/ORU storage Building B5	438,000	ton/yr	7.31E-10	lb/ton[d]	AP-42 Section13.2.4	1.60E-07
Propane (ORU)	1,500	Mgal/yr	0.7	lb/Mgal	AP-42 Table 1.5-1	0.53
LFG (ORU)	245.46	MMdscf/yr[e]	9.35	lb/MMdscf	AP-42 Table 2.4-5	1.15
Thermal Oxidizer (TOU-1)	714.223	Mgal/yr	0.7	lb/MMdscf[f]	AP-42 Table 1.5-1	0.25
ORU Discharge (V-1503)	438,000	ton/yr	1.38E-09	lb/ton[g]	AP-42 Section 13.2.4	3.03E-07
ORU Boiler (ME-1902)	100,690	gal/yr	0.7	lb/Mgal	AP-42 Table 1.5-1	3.52E-02
Unpaved Roads	12,480	VMT/yr	0.04	lb/VMT[h]	AP-42 Section 13.2.2	0.2
Cover Soil	20,000	ton/yr	0.034	lb/ton[i]	AP-42 Section 11.9	0.3
Material Transfer-Offload	100,000	ton/yr	1.05E-05	lb/ton	AP-42 Section 13.2.4	0.001
Reagent Transfer	100,000	ton/yr	1.05E-05	lb/ton	AP-42 Section 13.2.4	0.001
Concrete Crushing	78,000	ton/yr	2.29E-04	lb/ton[j]	AP-42 Section 11.19.2	0.009
Generator	209,196	hp-hr/yr[k]	0.0022	lb/hp-hr	AP-42 Section 3.3	0.2
Waste Oil Heater	2,200	gal/yr	2.85	lb/Mgal	AP-42 Section 1.11-1	3.14E-03
Propane Heater	1,400	gal/yr	0.7	lb/Mgal	AP-42 Section 1.5-1	4.90E-04
Total $PM_{2.5}$ Emissions						**2.77**

a. Assumes 7 mph wind and 21% moisture
b. Assumes 7 mph wind and 60% moisture
c. Assumes 0.001 mph wind (inside building) and 0.2% moisture
d. Assumes 0.001 mph wind (inside building) and 5% moisture
e. 467 cfm of LFG flow for 8760 hr/yr, emission factor 17 lb/MMdscf methane, LFG is 55% methane
f. Assumes both fume and pilot emissions similar to propane emissions
g. Assumes 0.001 mph wind (inside building), 0.5% moisture, 98% control (BH)
h. Assumes 80% control of particulate due to watering
i. Combination of activities: bulldozing (AP-42 Table 11.9-1, 7% silt, 20% moisture, 32 ton/day, 10 hr/day)+scraper removing topsoil (AP-42 Table 11.9-4)+unload topsoil (AP-42 Table 11.9-4), 75% control
j. Combination of activities: controlled emissions for truck unload, transfer to crusher, tertiary crushing, and truck load
k. Assumes 100 kW (134.1 hp) diesel engine operating 1560 hr/yr.

SO_2

Emission Point	Operating Parameters		Emission Factor			ton/yr
			Rate		Reference	
Propane (ORU)	1,500	Mgal/yr	11.22	lb/Mgal[a]	AP-42 Section 1.5	8.41
LFG (ORU)	245.46	MMdscf/yr	49.9	lb/MMdscf[b]	Source Estimate	6.12
Thermal Oxidizer (TOU-1)	714.223	Mgal/yr	11.22	lb/Mgal[a]	AP-42 Table 1.5-1	4.01
ORU Boiler (ME-1902)	100,690	gal/yr	11.22	lb/Mgal[a]	AP-42 Table 1.5-1	0.56
Crusher Generator	209,196	hp-hr/yr[c]	2.05E-03	lb/hp-hr	AP-42 Section 3.3	0.2
Waste Oil Heater	2,200	gal/yr	214	lb/Mgal[d]	AP-42 Section 1.11-2	0.24
Propane Heater	1,400	gal/yr	0.01	lb/Mgal[e]	AP-42 Section 1.5-1	7.00E-06
Total SO_2 Emissions						**19.56**

a. Assumes 15 grains sulfur/100 gallons
b. Assumes 300 ppmv sulfur content of LFG
c. Assumes 100 kW (134.1 hp) diesel engine operating 1560 hr/yr
d. Assumes 2% sulfur
e. Assumes 0.1 grain sulfur per 100 cf of gas

NO_x

Emission Point	Operating Parameters		Emission Factor			ton/yr
			Rate		Reference	
Propane (ORU)	1,500	Mgal/yr	13	lb/Mgal	AP-42 Table 1.5-1	9.75
LFG (ORU)	245.46	MMdscf/yr	37.4	lb/MMdscf	AP-42 Table 13.5-1	4.59
Thermal Oxidizer (TOU-1)	714.223	Mgal/yr	13	lb/MMdscf	AP-42 Table 1.5-1	4.64
ORU Boiler (ME-1902)	100,690	gal/yr	13	lb/Mgal	AP-42 Table 1.5-1	0.65
Crusher Generator	209,196	hp-hr/yr	0.031	lb/hp-hr	AP-42 Section 3.3	3.2
Waste Oil Heater	2,200	gal/yr	16	lb/Mgal	AP-42 Section 1.11-2	0.02
Propane Heater	1,400	gal/yr	13	lb/Mgal	AP-42 Section 1.5-1	0.01
Total NO_x Emissions						**22.9**

CO

Emission Point	Operating Parameters		Emission Factor			ton/yr
			Rate		Reference	
Propane (ORU)	1,500	Mgal/yr	7.5	lb/Mgal	AP-42 Table 1.5-1	5.63
LFG (ORU)	245.46	MMdscf/yr	170.5	lb/MMdscf	AP-42 Table 13.5-2	20.93
Thermal Oxidizer (TOU-1)	714.223	Mgal/yr	7.5	lb/MMdscf	AP-42 Table 1.5-1	2.68
ORU Boiler (ME-1902)	100,690	gal/yr	7.5	lb/Mgal	AP-42 Table 1.5-1	0.38
Crusher Generator	209,196	hp-hr/yr	6.68E-03	lb/hp-hr	AP-42 Section 3.3	0.7
Waste Oil Heater	2,200	gal/yr	2.1	lb/Mgal	AP-42 Section 1.11-2	0.002
Propane Heater	1,400	gal/yr	7.5	lb/Mgal	AP-42 Section 1.5-1	5.25E-03
Total CO Emissions						**30.3**

VOC

Emission Point	Operating Parameters		Emission Factor			ton/yr
			Rate		Reference	
Bioremediation/ORU storage Building B5	438,000	ton/yr			Ch Waste Model	4.46
Propane (ORU)	1,500	Mgal/yr	0.8	lb/Mgal	AP-42 Table 1.5-1	0.60
LFG (ORU)	245.46	MMdscf/yr	77	lb/MMdscf	AP-42 Table 13.5-1	9.45
Thermal Oxidizer (TOU-1)	714.223	Mgal/yr	1.0	lb/MMdscf	AP-42 Table 1.5-1	0.36
ORU Boiler (ME-1902)	100,690	gal/yr	1	lb/Mgal	AP-42 Table 1.5-1	0.05
Crusher Generator	209,196	hp-hr/yr	2.47E-03	lb/hp-hr	AP-42 Section 3.3	0.3
Waste Oil Heater	2,200	gal/yr	1.0	lb/Mgal	AP-42 Section 1.11-3	1.10E-03
Propane Heater	1,400	gal/yr	1.0	lb/Mgal	AP-42 Section 1.5-1	7.00E-04
Vehicle Fueling/Storage	27,312	gal/yr			EPA Tanks	0.03
ORUTNK1	6,300,000	gal/yr			EPA Tanks	0.006
ORUTNK2	6,300,000	gal/yr			EPA Tanks	0.006
Total VOC Emissions						**15.2**

Greenhouse Gas (GHG)

Emission Point	Operating Parameters		Emission Factor			ton/yr
			Rate		Reference	
Propane (ORU) CO_2	1,500	Mgal/yr	12,613	lb/Mgal	40 CFR 98 Table C-1	9,460
CH_4 (CO_2e)			15.0	lb/Mgal	40 CFR 98 Table C-2	11
N_2O (CO_2e)			35.88	lb/Mgal	40 CFR 98 Table C-2	27
LFG (ORU) CO_2	245.46	MMdscf/yr	103592.8	lb/MMdscf	40 CFR 98, LANDGEM	12,714
CH_4 (CO_2e)			81.6	lb/MMdscf	40 CFR 98, Table C-2	10
N2O (CO2e)			191.4	lb/MMdscf	40 CFR 98, Table C-2	23
Thermal Ox (TOU-1) CO_2	714.223	Mgal/yr	12613	lb/Mgal	40 CFR 98 Table C-1	4,504
CH_4 (CO_2e)			15.0	lb/Mgal	40 CFR 98 Table C-2	5
N_2O (CO_2e)			35.88	lb/Mgal	40 CFR 98 Table C-2	13
ORU Boiler (ME-1902) CO_2	100,690	gal/yr	12,613	lb/Mgal	40 CFR 98 Table C-1	635
CH_4 (CO_2e)			15.0	lb/Mgal	40 CFR 98 Table C-2	0.8
N_2O (CO_2e)			35.88	lb/Mgal	40 CFR 98 Table C-2	1.8
Crusher Generator CO_2	209,196	hp-hr/yr	0.41	lb/hp-hr	40 CFR 98 Table C-1	43
CH_4 (CO_2e)			4.20E-04	lb/hp-hr	40 CFR 98 Table C-2	0.04
N_2O (CO_2e)			1.00E-03	lb/hp-hr	40 CFR 98 Table C-2	0.10
Waste Oil Heater CO_2	2,200	gal/yr	22,513	lb/Mgal	40 CFR 98 Table C-1	25
CH_4 (CO_2e)			23	lb/Mgal	40 CFR 98 Table C-2	0.03
N_2O (CO_2e)			54	lb/Mgal	40 CFR 98 Table C-2	0.06
Propane Heater CO_2	1,400	gal/yr	12,613	lb/Mgal	40 CFR 98 Table C-1	8.8
CH_4 (CO_2e)			15.0	lb/Mgal	40 CFR 98 Table C-2	0.01
N_2O (CO_2e)			35.88	lb/Mgal	40 CFR 98 Table C-2	0.03
Total GHG Emissions						**27,482**

Hazardous Air Pollutants

Compound/Emission Point	Operating Parameters		Emission Factor			Emissions ton/yr
			Rate		Reference	
1,1,2,2-Tetrachloroethane						
ORU LFG	245.5	MMscf/yr	2.15E-03	lb/MMscf	Engineering Estimate	**2.64E-04**
1,1,1-Trichloroethane						
ORU LFG	245.5	MMscf/yr	3.12E-04	lb/MMscf	Engineering Estimate	**3.83E-05**
1,1,2-Trichloroethane						
Waste Handling/Inspection	629	ton/yr	4.96	lb/ton	Engineering Estimate	1.56
Landfill	1,258,172	lb/yr	0.00274	lb/ton	Engineering Estimate	8.62E-04
Macro Encapsulation	599,024	lb/yr	7.68E-03	lb/ton	Engineering Estimate	1.15E-03
Stabilization	652,380	lb/yr	2.32E-05	lb/ton	Engineering Estimate	3.78E-06
Solidification	10,120	lb/yr	6.76E-05	lb/ton	Engineering Estimate	1.71E-07
Bioremediation	24,440	lb/yr	2.59E-02	lb/ton	Engineering Estimate	1.58E-04
Total						**1.56**
1,2,4-Trichlorobenzene						-
Waste Handling/Inspection	99,480	lb/yr	1.500E-04	lb/ton	Engineering Estimate	3.73E-06
Landfill	99,480	lb/yr	2.700E-06	lb/ton	Engineering Estimate	6.71E-08
Total						**3.8E-06**
1,4-Dichlorobenzene						-
Waste Handling/Inspection	202,000	lb/yr	0.000122	lb/ton	Engineering Estimate	6.16E-06
Macro Encapsulation	518,240	lb/yr	0.00918	lb/ton	Engineering Estimate	1.19E-03
Bioremediation	87,120	lb/yr	0.0134	lb/ton	Engineering Estimate	2.92E-04
Total						**1.5E-03**
1,1-Dichloroethane						
ORU LFG	245.5	MMscf/yr	1.10E-03	lb/MMscf	Engineering Estimate	**1.35E-04**
1,2-Dichloroethane						
ORU LFG	245.5	MMscf/yr	6.07E-03	lb/MMscf	Engineering Estimate	**7.44E-04**
1,1-Dichloroethene						
ORU LFG	245.5	MMscf/yr	2.27E-04	lb/MMscf	Engineering Estimate	**2.78E-05**
1,2-Dichloropropane						
ORU LFG	245.5	MMscf/yr	2.64E-04	lb/MMscf	Engineering Estimate	**3.25E-05**
7,12-Dimethylbenz(a)anthr						
ORU Boiler	100,690	gal/yr	4.450E-04	lb/Mgal	AP-42 Table 1.4-3	**2.24E-05**
1,3-Butadiene						
Thermal Oxidizer (TOU-1)	20.5	MMscf/yr	32.46	lb/MMscf	Engineering Estimate	0.33
Concrete Crush Engines	7,941	MMBtu/yr	3.91E-05	lb/MMBtu	AP-42 Table 3.3-2	1.55E-04
Total						**0.33**
1,4-Dioxane						
Macro Encapsulation	1,332,262	lb/yr	2.550E-04	lb/ton	Engineering Estimate	**8.49E-05**
3-Methylchloranthrene						
ORU Boiler	100,690	gal/yr	5.000E-05	lb/Mgal	AP-42 Table 1.4-3	**2.52E-06**
2-Methylnaphthalene						
ORU Boiler	100,690	gal/yr	6.670E-04	lb/Mgal	AP-42 Table 1.4-3	**3.36E-05**
2-Nitropropane						
Waste Handling/Inspection	280,292	lb/yr	0.007	lb/ton	Engineering Estimate	5.25E-04
Landfill	20,200	lb/yr	0.103	lb/ton	Engineering Estimate	5.20E-04
Macro Encapsulation	226,576	lb/yr	0.00148	lb/ton	Engineering Estimate	8.38E-05

Compound/Emission Point	Operating Parameters		Emission Factor			Emissions ton/yr
			Rate		Reference	
Stabilization	1,320	lb/yr	10.5	lb/ton	Engineering Estimate	3.47E-03
Total						**4.6E-03**
2,4-Dinitrotoluene						
Macro Encapsulation	511,200	lb/yr	0.00761	lb/ton	Engineering Estimate	**9.73E-04**
2,4,5 Trichlorophenol						
Macro Encapsulation	797,692	lb/yr	0.000426	lb/ton	Engineering Estimate	**8.50E-05**
Acetaldehyde						
Concrete Crush Engines	7,941	MMBtu/yr	7.67E-04	lb/MMBtu	AP-42 Table 3.3-2	**3.05E-03**
Acenaphthene						
ORU Boiler	100,690	gal/yr	5.000E-05	lb/Mgal	AP-42 Table 1.4-3	**2.52E-06**
Acetonitrile						
Macro Encapsulation	1,335,002	lb/yr	0.0000572	lb/ton	Engineering Estimate	**1.91E-05**
Acrolein						
Concrete Crush Engines	7,941	MMBtu/yr	9.25E-05	lb/MMBtu	AP-42 Table 3.3-2	**3.67E-04**
Acrylonitrile						
ORU LFG	245.5	MMscf/yr	1.06E-04	lb/MMscf	Engineering Estimate	**1.31E-05**
Anthracene						
ORU Boiler	100,690	gal/yr	6.670E-05	lb/Mgal	AP-42 Table 1.4-3	**3.36E-06**
Antimony						
Waste Oil Heater	2,200	gal/yr	0.0045	lb/Mgal	AP-42 Sec 1.11	**4.95E-06**
Arsenic						
Waste Oil Heater	2,200	gal/yr	0.06	lb/Mgal	AP-42 Sec 1.11	6.60E-05
Propane Space Heater	1,400	gal/yr	0.00013	lb/Mgal	CATEF	9.10E-08
Total						**6.61E-05**
Asbestos						
Macro Encapsulation	40,610	lb/yr	0.0575	lb/ton	Engineering Estimate	**5.84E-04**
Benz(a)anthracene						
ORU Boiler	100,690	gal/yr	5.00E-05	lb/Mgal	AP-42 Table 1.4-3	**2.52E-06**
Benzene						
Thermal Oxidizer (TOU-1)	20.5	MMscf/yr	18.98	lb/MMscf	Engineering Estimate	0.19
ORU LFG	245.5	MMscf/yr	7.40E-03	lb/MMscf	Engineering Estimate	9.08E-04
ORU Propane	0.2	MM scf/yr	2.10E-03	lb/MM sf	Engineering Estimate	2.10E-07
ORU Boiler	100,690	gal/yr	5.84E-02	lb/Mgal	AP-42 Table 1.4-3	2.94E-03
Concrete Crush Engines	7,941	MMBtu/yr	9.33E-04	lb/MMBtu	AP-42 Table 3.3-2	3.70E-03
Waste Handling/Inspection	1,251,332	lb/yr	0.0000284	lb/ton	Engineering Estimate	8.88E-06
Landfill	1,251,332	lb/yr	0.00011	lb/ton	Engineering Estimate	3.44E-05
Macro Encapsulation	2,233,411	lb/yr	0.00188	lb/ton	Engineering Estimate	1.05E-03
Stabilization	652,380	lb/yr	0.0000742	lb/ton	Engineering Estimate	1.21E-05
Gas Tank	9,927	gal/yr	0.77	% VOC	AP-42 Sec 7.1	2.68E-04
Bioremediation	2,440	lb/yr	0.0259	lb/ton	Engineering Estimate	1.58E-05
Bioremediation	62,060	lb/yr	0.0148	lb/ton	Engineering Estimate	2.30E-04
Bioremediation	257,480	lb/yr	0.0132	lb/ton	Engineering Estimate	8.50E-04
Bioremediation	440	lb/yr	1.98	lb/ton	Engineering Estimate	2.18E-04
Total						**0.20**
Benzo(a)pyrene						
ORU Boiler	100,690	gal/yr	3.34E-05	lb/Mgal	AP-42 Table 1.4-3	**1.68E-06**

Compound/Emission Point	Operating Parameters		Emission Factor			Emissions ton/yr
			Rate		Reference	
Benzo(b)fluoranthene						
ORU Boiler	100,690	gal/yr	5.00E-05	lb/Mgal	AP-42 Table 1.4-3	**2.52E-06**
Benzo(g,h,i)perylene						
ORU Boiler	100,690	gal/yr	3.34E-05	lb/Mgal	AP-42 Table 1.4-3	**1.68E-06**
Benzo(k)fluoranthene						
ORU Boiler	100,690	gal/yr	5.00E-05	lb/Mgal	AP-42 Table 1.4-3	**2.52E-06**
Beryllium						
Waste Oil Heater	2,200	gal/yr	0.0018	lb/Mgal	AP-42 Sec 1.11	1.98E-06
Propane Space Heater	1,400	gal/yr	0.00003	lb/Mgal	CATEF	2.10E-08
Total						**2.00E-06**
Cadmium						
Waste Oil Heater	2,200	gal/yr	0.012	lb/Mgal	AP-42 Sec 1.11	1.32E-05
Propane Space Heater	1,400	gal/yr	0.00006	lb/Mgal	CATEF	4.20E-08
Total						**1.32E-05**
Carbon Disulfide						
Thermal Oxidizer (TOU-1)	20.5	MMscf/yr	0.95	lb/MMscf	Engineering Estimate	0.01
ORU LFG	245.5	MMscf/yr	8.91E-04	lb/MMscf	Engineering Estimate	1.09E-04
Waste Handling/Inspection	927,392	lb/yr	0.0000199	lb/ton	Engineering Estimate	4.61E-06
Landfill	927,392	lb/yr	0.000282	lb/ton	Engineering Estimate	6.54E-05
Macro Encapsulation	226,550	lb/yr	0.000141	lb/ton	Engineering Estimate	7.99E-06
Stabilization	648,420	lb/yr	0.0000105	lb/ton	Engineering Estimate	1.70E-06
Bioremediation	24,440	lb/yr	0.0259	lb/ton	Engineering Estimate	1.58E-04
Total						**1.01E-02**
Carbon Tetrachloride						
ORU LFG	245.5	MMscf/yr	3.60E-04	lb/MMscf	Engineering Estimate	4.42E-05
Waste Handling/Inspection	980,272	lb/yr	0.0000189	lb/ton	Engineering Estimate	4.63E-06
Landfill	980,272	lb/yr	0.000122	lb/ton	Engineering Estimate	2.99E-05
Macro Encapsulation	743,516	lb/yr	0.00516	lb/ton	Engineering Estimate	9.59E-04
Stabilization	2,640	lb/yr	0.00105	lb/ton	Engineering Estimate	6.93E-07
Bioremediation	24,440	lb/yr	0.0259	lb/ton	Engineering Estimate	1.58E-04
Total						**1.20E-03**
Carbonyl Sulfide						
ORU LFG	245.5	MMscf/yr	6.70E-04	lb/MMscf	Engineering Estimate	**8.22E-05**
Chlordane						
Macro Encapsulation	552,588	lb/yr	0.00694	lb/ton	Engineering Estimate	**9.59E-04**
Chlorobenzene						
ORU LFG	245.5	MMscf/yr	2.63E-04	lb/MMscf	Engineering Estimate	3.23E-05
Waste Handling/Inspection	10,013,702	lb/yr	0.000234	lb/ton	Engineering Estimate	5.86E-04
Landfill	10,013,702	lb/yr	0.000137	lb/ton	Engineering Estimate	3.43E-04
Macro Encapsulation	752,616	lb/yr	0.00523	lb/ton	Engineering Estimate	9.84E-04
Stabilization	652,380	lb/yr	0.0000487	lb/ton	Engineering Estimate	7.94E-06
Solidification	9,240	lb/yr	0.0315	lb/ton	Engineering Estimate	7.28E-05
Bioremediation	24,440	lb/yr	0.00259	lb/ton	Engineering Estimate	1.58E-05
Total						**2.04E-03**
Chloroform						
ORU LFG	245.5	MMscf/yr	2.79E-04	lb/MMscf	Engineering Estimate	**3.43E-05**

Compound/Emission Point	Operating Parameters		Emission Factor Rate		Emission Factor Reference	Emissions ton/yr
Waste Handling/Inspection	5,280	lb/yr	0.00000001	lb/ton	Engineering Estimate	1.32E-11
Landfill	5,280	lb/yr	0.00000006	lb/ton	Engineering Estimate	7.92E-11
Macro Encapsulation	511,200	lb/yr	0.0075	lb/ton	Engineering Estimate	9.59E-04
Total						**9.93E-04**
Chromium						
Waste Oil Heater	2,200	gal/yr	0.18	lb/Mgal	Engineering Estimate	**1.98E-04**
Chrysene						
ORU Boiler	100,690	gal/yr	5.00E-05	lb/Mgal	AP-42 Table 1.4-3	**2.52E-06**
Cobalt						
Waste Oil Heater	2,200	gal/yr	0.0052	lb/Mgal	Engineering Estimate	**5.72E-06**
Copper						
Propane Space Heater	1,400	gal/yr	0.00031	lb/Mgal	Engineering Estimate	**2.17E-07**
Cresol						
Waste Handling/Inspection	854,796	lb/yr	0.00000457	lb/ton	Engineering Estimate	9.77E-07
Landfill	840,876	lb/yr	0.00000003	lb/ton	Engineering Estimate	6.31E-09
Macro Encapsulation	2,751,996	lb/yr	0.00397	lb/ton	Engineering Estimate	2.73E-03
Stabilization	3,960	lb/yr	0.00582	lb/ton	Engineering Estimate	5.76E-06
Bioremediation	24,440	lb/yr	0.0259	lb/ton	Engineering Estimate	1.58E-04
Total						**2.90E-03**
Cyanide compounds						
Waste Handling/Inspection	12,320	lb/yr	0.0838	lb/ton	Engineering Estimate	2.58E-04
Landfill	12,320	lb/yr	1.27	lb/ton	Engineering Estimate	3.91E-03
Macro Encapsulation	4,980	lb/yr	0.000308	lb/ton	Engineering Estimate	3.83E-07
Leachate	489,840	lb/yr	0.0417	lb/ton	Engineering Estimate	5.11E-03
Total						**9.28E-03**
Dibenzo(a,h)anthracene						
ORU Boiler	100,690	gal/yr	3.34E-05	lb/Mgal	AP-42 Table 1.4-3	**1.68E-06**
Dibutylphthalate						
Macro Encapsulation	1,284,132	lb/yr	0.0000421	lb/ton	Engineering Estimate	**1.35E-05**
Dichlorobenzene						
ORU LFG	245.5	MMscf/yr	1.23E-03	lb/MMscf	Engineering Estimate	1.51E-04
ORU Propane	0.2	MM scf/yr	1.20E-03	lb/MM sf	Engineering Estimate	1.20E-07
ORU Boiler	100,690	gal/yr	3.34E-02	lb/Mgal	AP-42 Table 1.4-3	1.68E-03
Total						**1.83E-03**
Dimethyl Sulfate						
Waste Handling/Inspection	680	lb/yr	0.0375	lb/ton	Engineering Estimate	6.38E-06
Landfill	680	lb/yr	0.000285	lb/ton	Engineering Estimate	4.85E-08
Stabilization	680	lb/yr	52.5	lb/ton	Engineering Estimate	8.93E-03
Total						**8.93E-03**
Epichlorohydrin						
Waste Handling/Inspection	37,120	lb/yr	0.00327	lb/ton	Engineering Estimate	3.03E-05
Landfill	37,120	lb/yr	0.00167	lb/ton	Engineering Estimate	1.55E-05
Solidification	880	lb/yr	21	lb/ton	Engineering Estimate	4.62E-03
Total						**4.67E-03**
Ethyl Benzene						
Thermal Oxidizer (TOU-1)	20.5	MMscf/yr	0.97	lb/MMscf	Engineering Estimate	0.01

Compound/Emission Point	Operating Parameters		Emission Factor Rate		Emission Factor Reference	Emissions ton/yr
ORU LFG	245.5	MMscf/yr	3.96E-02	lb/MMscf	Engineering Estimate	4.86E-03
Waste Handling/Inspection	1,493,160	lb/yr	0.0000199	lb/ton	Engineering Estimate	7.43E-06
Landfill	1,493,160	lb/yr	0.00000881	lb/ton	Engineering Estimate	3.29E-06
Macro Encapsulation	1,705,445	lb/yr	0.000955	lb/ton	Engineering Estimate	4.07E-04
Stabilization	649,300	lb/yr	0.0000122	lb/ton	Engineering Estimate	1.98E-06
Solidification	10,120	lb/yr	0.192	lb/ton	Engineering Estimate	4.86E-04
Gas Tank	9,927	gal/yr	0.04	% VOC	AP-42 Sec 7.1	1.39E-05
Bioremediation	24,440	lb/yr	0.0259	lb/ton	Engineering Estimate	1.58E-04
Bioremediation	62,060	lb/yr	0.0148	lb/ton	Engineering Estimate	2.30E-04
Bioremediation	440	lb/yr	1.98	lb/ton	Engineering Estimate	2.18E-04
Total						**1.64E-02**
Ethyl Carbamate						
Macro Encapsulation	494	lb/yr	0.000151	lb/ton	Engineering Estimate	**1.86E-08**
Ethyl Chloride						
ORU LFG	245.5	MMscf/yr	1.33E-03	lb/MMscf	Engineering Estimate	1.63E-04
Waste Handling/Inspection	9,240	lb/yr	0.00015	lb/ton	Engineering Estimate	3.47E-07
Landfill	9,240	lb/yr	0.00402	lb/ton	Engineering Estimate	9.29E-06
Solidification	9,240	lb/yr	0.21	lb/ton	Engineering Estimate	4.85E-04
Total						**6.58E-04**
Ethylene Dibromide						
ORU LFG	245.5	MMscf/yr	4.40E-04	lb/MMscf	Engineering Estimate	5.40E-05
Waste Handling/Inspection	99,480	lb/yr	0.00015	lb/ton	Engineering Estimate	3.73E-06
Total						**5.77E-05**
Ethyl Dichloride						
Waste Handling/Inspection	4,797,690	lb/yr	0.0000002	lb/ton	Engineering Estimate	2.40E-07
Landfill	4,797,690	lb/yr	0.00000373	lb/ton	Engineering Estimate	4.47E-06
Total						**4.71E-06**
Ethylene Dichloride						
Macro Encapsulation	519,280	lb/yr	0.00751	lb/ton	Engineering Estimate	**9.75E-04**
Fluoranthene						
ORU Boiler	100,690	gal/yr	8.34E-05	lb/Mgal	AP-42 Table 1.4-3	**4.20E-06**
Fluorene						
ORU Boiler	100,690	gal/yr	7.78E-05	lb/Mgal	AP-42 Table 1.4-3	**3.92E-06**
Formaldehyde						
ORU Propane	0.2	MM scf/yr	7.50E-02	lb/MM sf	Engineering Estimate	7.50E-06
ORU Boiler	100,690	gal/yr	2.09E+00	lb/Mgal	AP-42 Table 1.4-3	1.05E-01
Concrete Crush Engines	7,941	MMBtu/yr	1.18E-03	lb/MMBtu	AP-42 Table 3.3-2	4.69E-03
Waste Handling/Inspection	68,626	lb/yr	0.0107	lb/ton	Engineering Estimate	1.84E-04
Landfill	68,626	lb/yr	0.629	lb/ton	Engineering Estimate	1.08E-02
Macro Encapsulation	513,908	lb/yr	0.0075	lb/ton	Engineering Estimate	9.64E-04
Solidification	41,556	lb/yr	20.8	lb/ton	Engineering Estimate	2.16E-01
Total						**0.34**
Heptachlor						
Macro Encapsulation	526,228	lb/yr	0.00729	lb/ton	Engineering Estimate	**9.59E-04**
Hexachlorobenzene						
Macro Encapsulation	511,200	lb/yr	0.00751	lb/ton	Engineering Estimate	**9.60E-04**

Compound/Emission Point	Operating Parameters		Emission Factor Rate		Emission Factor Reference	Emissions ton/yr
Hexachlorocyclopentadiene						
Macro Encapsulation	511,200	lb/yr	0.0075	lb/ton	Engineering Estimate	**9.59E-04**
Hexachloroethane						
Macro Encapsulation	528,530	lb/yr	0.00728	lb/ton	Engineering Estimate	**9.62E-04**
Hexane						
Thermal Oxidizer (TOU-1)	20.5	MMscf/yr	1.32	lb/MMscf	Engineering Estimate	0.01
ORU LFG	245.5	MMscf/yr	1.12E-02	lb/MMscf	Engineering Estimate	1.37E-03
ORU Propane	0.2	MM scf/yr	1.80	lb/MM sf	Engineering Estimate	1.80E-04
ORU Boiler	100,690	gal/yr	5.00E+01	lb/Mgal	AP-42 Table 1.4-3	2.52E+00
Gas Tank	9,927	gal/yr	1.84	% VOC	Engineering Estimate	6.40E-04
Total						**2.53**
Hydrochloric Acid						
ORU LFG	245.5	MMscf/yr	9.55E-02	lb/MMscf	Engineering Estimate	1.17E-02
Waste Handling/Inspection	1,509,560	lb/yr	0.0384	lb/ton	Engineering Estimate	1.45E-02
Landfill	1,509,560	lb/yr	0.164	lb/ton	Engineering Estimate	6.19E-02
Macro Encapsulation	17,900	lb/yr	0.206	lb/ton	Engineering Estimate	9.22E-04
Stabilization	49,060	lb/yr	249	lb/ton	Engineering Estimate	3.05
Solidification	440	lb/yr	1150	lb/ton	Engineering Estimate	1.27E-01
Total						**3.27**
Hydrogen Fluoride						
Waste Handling/Inspection	2,332,660	lb/yr	0.0242	lb/ton	Engineering Estimate	1.41E-02
Landfill	2,332,660	lb/yr	0.454	lb/ton	Engineering Estimate	2.65E-01
Macro Encapsulation	3,640	lb/yr	0.0226	lb/ton	Engineering Estimate	2.06E-05
Stabilization	650,620	lb/yr	0.109	lb/ton	Engineering Estimate	1.77E-02
Solidification	440	lb/yr	10.5	lb/ton	Engineering Estimate	1.16E-03
Total						**2.98E-01**
Indeno(1,2,3-cd)pyrene						
ORU Boiler	100,690	gal/yr	5.00E-05	lb/Mgal	AP-42 Table 1.4-3	**2.52E-06**
Lead						
Leachate	849,840	lb/yr	0.00162	lb/ton	Engineering Estimate	3.44E-04
Waste Oil Heater	2,200	gal/yr	0.025	lb/Mgal	Engineering Estimate	2.75E-05
Propane Space Heater	1,400	gal/yr	0.00051	lb/Mgal	Engineering Estimate	3.57E-07
Total						**3.72E-04**
Lindane						
Waste Handling/Inspection	2,640	lb/yr	0.0376	lb/ton	Engineering Estimate	2.48E-05
Landfill	2,640	lb/yr	0.00000004	lb/ton	Engineering Estimate	2.64E-11
Macro Encapsulation	545,548	lb/yr	0.00703	lb/ton	Engineering Estimate	9.59E-04
Stabilization	2,640	lb/yr	52.6	lb/ton	Engineering Estimate	3.47E-02
Total						**3.57E-02**
Manganese						
Waste Oil Heater	2,200	gal/yr	0.05	lb/Mgal	AP-42 Sec 1.11	5.50E-05
Propane Space Heater	1,400	gal/yr	0.00131	lb/Mgal	CATEF	9.17E-07
Total						**5.59E-05**
Methanol						
Macro Encapsulation	1,555,478	lb/yr	0.00109	lb/ton	Engineering Estimate	4.24E-04
Solidification	43,933	lb/yr	134	lb/ton	Engineering Estimate	1.47E+00

Compound/Emission Point	Operating Parameters		Emission Factor			Emissions ton/yr
			Rate		Reference	
Bioremediation	24,440	lb/yr	0.0259	lb/ton	Engineering Estimate	1.58E-04
Total						**1.47E+00**
Methoxychlor						
Macro Encapsulation	512,960	lb/yr	0.00748	lb/ton	Engineering Estimate	**9.59E-04**
Methyl Bromide						
Waste Handling/Inspection	513,908	lb/yr	0.00751	lb/ton	Engineering Estimate	9.65E-04
Stabilization	513,908	lb/yr	10.5	lb/ton	Engineering Estimate	1.35E+00
Total						**1.35E+00**
MIBK						
ORU LFG	245.5	MMscf/yr	1.45E-02	lb/MMscf	Engineering Estimate	1.78E-03
Waste Handling/Inspection	1,465,072	lb/yr	0.0224	lb/ton	Engineering Estimate	8.20E-03
Macro Encapsulation	1,708,303	lb/yr	0.0209	lb/ton	Engineering Estimate	8.93E-03
Stabilization	648,420	lb/yr	0.0691	lb/ton	Engineering Estimate	1.12E-02
Bioremediation	24,440	lb/yr	0.0259	lb/ton	Engineering Estimate	1.58E-04
Bioremediation	21,580	lb/yr	0.0334	lb/ton	Engineering Estimate	1.80E-04
Total						**3.05E-02**
Methyl Methacrylate						
Macro Encapsulation	1,332,562	lb/yr	0.00024	lb/ton	Engineering Estimate	**8.00E-05**
Methyl Chloride						
Thermal Oxidizer (TOU-1)	20.5	MMscf/yr	0.42	lb/MMscf	Engineering Estimate	0.004
ORU LFG	245.5	MMscf/yr	2.36E-04	lb/MMscf	Engineering Estimate	2.90E-05
Total						**4.38E-03**
Methylene Chloride						
Thermal Oxidizer (TOU-1)	20.5	MMscf/yr	0.62	lb/MMscf	Engineering Estimate	0.006
ORU LFG	245.5	MMscf/yr	5.21E-03	lb/MMscf	Engineering Estimate	6.39E-04
Waste Handling/Inspection	1,230,295	lb/yr	0.00016	lb/ton	Engineering Estimate	4.92E-05
Macro Encapsulation	1,671,007	lb/yr	0.0275	lb/ton	Engineering Estimate	1.15E-02
Stabilization	648,420	lb/yr	0.0000126	lb/ton	Engineering Estimate	2.04E-06
Solidification	11,880	lb/yr	0.171	lb/ton	Engineering Estimate	5.08E-04
Bioremediation	24,440	lb/yr	0.0259	lb/ton	Engineering Estimate	1.58E-04
Total						**1.92E-02**
Naphthalene						
ORU Propane	0.2	MM scf/yr	6.10E-04	lb/MM sf	Engineering Estimate	6.10E-08
ORU Boiler	100,690	gal/yr	1.70E-02	lb/Mgal	AP-42 Table 1.4-3	8.56E-04
Concrete Crush Engines	7,941	MMBtu/yr	8.48E-05	lb/MMBtu	AP-42 Table 3.3-2	3.37E-04
Waste Handling/Inspection	657,880	lb/yr	0.00144	lb/ton	Engineering Estimate	2.37E-04
Macro Encapsulation	33,240	lb/yr	0.0000682	lb/ton	Engineering Estimate	5.67E-07
Solidification	5,960	lb/yr	63	lb/ton	Engineering Estimate	9.39E-02
Bioremediation	72,160	lb/yr	0.00125	lb/ton	Engineering Estimate	2.26E-05
Bioremediation	62,060	lb/yr	0.0148	lb/ton	Engineering Estimate	2.30E-04
Total						**9.56E-02**
Nickel						
Waste Oil Heater	2,200	gal/yr	0.16	lb/Mgal	AP-42 Sec 1.11	1.76E-04
Propane Space Heater	1,400	gal/yr	0.00208	lb/Mgal	CATEF	1.46E-06
Total						**1.77E-04**
Nitrobenzene						

Compound/Emission Point	Operating Parameters		Emission Factor			Emissions ton/yr
			Rate		Reference	
Waste Handling/Inspection	284,662	lb/yr	0.0000753	lb/ton	Engineering Estimate	5.36E-06
Macro Encapsulation	737,758	lb/yr	0.0052	lb/ton	Engineering Estimate	9.59E-04
Stabilization	1,320	lb/yr	0.00421	lb/ton	Engineering Estimate	1.39E-06
Bioremediation	24,440	lb/yr	0.0259	lb/ton	Engineering Estimate	1.58E-04
Total						**1.12E-03**
Pentachlorophenol						
Macro Encapsulation	803,852	lb/yr	0.00513	lb/ton	Engineering Estimate	1.03E-03
Bioremediation	72,160	lb/yr	0.00125	lb/ton	Engineering Estimate	2.26E-05
Bioremediation	77,800	lb/yr	0.00116	lb/ton	Engineering Estimate	2.26E-05
Bioremediation	1,208,400	lb/yr	0.00132	lb/ton	Engineering Estimate	3.99E-04
Total						**1.47E-03**
Phenanthrene						
ORU Boiler	100,690	gal/yr	4.73E-04	lb/Mgal	AP-42 Table 1.4-3	**2.38E-05**
Phenol						
Macro Encapsulation	2,138,019	lb/yr	0.0142	lb/ton	Engineering Estimate	7.59E-03
Solidification	35,916	lb/yr	10.9	lb/ton	Engineering Estimate	9.79E-02
Propane Space Heater	1,400	gal/yr	0.00108	lb/Mgal	CATEF	7.56E-07
Bioremediation	72,160	lb/yr	0.00125	lb/ton	Engineering Estimate	2.26E-05
Bioremediation	62,060	lb/yr	0.0148	lb/ton	Engineering Estimate	2.30E-04
Total						**1.06E-01**
Propionaldehyde						
Waste Handling/Inspection	128	lb/yr	0.0000225	lb/ton	Engineering Estimate	7.20E-10
Landfill	128	lb/yr	0.0503	lb/ton	Engineering Estimate	1.61E-06
Stabilization	128	lb/yr	21	lb/ton	Engineering Estimate	6.72E-04
Total						**6.74E-04**
PCB						
Macro Encapsulation	133,571	lb/yr	0.00692	lb/ton	Engineering Estimate	2.31E-04
Bioremediation	87,120	lb/yr	0.0134	lb/ton	Engineering Estimate	2.92E-04
Total						**5.23E-04**
Polycyclic organic matter						
ORU Propane	0.2	MM scf/yr	5.18E-05	lb/MM sf	Engineering Estimate	**5.18E-09**
Pyrene						
ORU Boiler	100,690	gal/yr	1.39E-04	lb/Mgal	AP-42 Table 1.4-3	**7.00E-06**
Selenium						
Propane Space Heater	1,400	gal/yr	0.00013	lb/Mgal	CATEF	**9.10E-08**
Styrene						
Thermal Oxidizer (TOU-1)	20.5	MMscf/yr	0.47	lb/MMscf	Engineering Estimate	0.005
Waste Handling/Inspection	1,320	lb/yr	0.3	lb/ton	Engineering Estimate	9.90E-05
Landfill	1,320	lb/yr	0.097	lb/ton	Engineering Estimate	3.20E-05
Total						**4.99E-03**
Tetrachloroethylene						
ORU LFG	245.5	MMscf/yr	6.10E-03	lb/MMscf	Engineering Estimate	7.49E-04
Waste Handling/Inspection	6,873,033	lb/yr	0.0000176	lb/ton	Engineering Estimate	3.02E-05
Landfill	6,873,033	lb/yr	0.0000155	lb/ton	Engineering Estimate	2.66E-05
Macro Encapsulation	2,199,706	lb/yr	0.00191	lb/ton	Engineering Estimate	1.05E-03
Stabilization	652,380	lb/yr	0.0711	lb/ton	Engineering Estimate	1.16E-02

Compound/Emission Point	Operating Parameters		Emission Factor			Emissions ton/yr
			Rate		Reference	
Solidification	108,440	lb/yr	0.0209	lb/ton	Engineering Estimate	5.67E-04
Bioremediation	24,440	lb/yr	0.0259	lb/ton	Engineering Estimate	1.58E-04
Bioremediation	87,120	lb/yr	0.0134	lb/ton	Engineering Estimate	2.92E-04
Bioremediation	70,320	lb/yr	0.0637	lb/ton	Engineering Estimate	1.12E-03
Total						**1.56E-02**
Toluene						
Thermal Oxidizer (TOU-1)	20.5	MMscf/yr	16.23	lb/MMscf	Engineering Estimate	0.17
ORU LFG	245.5	MMscf/yr	1.33E-01	lb/MMscf	Engineering Estimate	1.64E-02
ORU Propane	0.2	MM scf/yr	3.40E-03	lb/MM sf	Engineering Estimate	3.40E-07
ORU Boiler	100,690	gal/yr	9.45E-02	lb/Mgal	AP-42 Table 1.4-3	4.76E-03
Concrete Crush Engines	7,941	MMBtu/yr	4.09E-04	lb/MMBtu	AP-42 Table 3.3-2	1.62E-03
Waste Handling/Inspection	6,719,434	lb/yr	0.0109	lb/ton	Engineering Estimate	1.83E-02
Landfill	6,719,434	lb/yr	0.0000292	lb/ton	Engineering Estimate	4.91E-05
Macro Encapsulation	2,260,276	lb/yr	0.0242	lb/ton	Engineering Estimate	1.37E-02
Stabilization	651,060	lb/yr	0.153	lb/ton	Engineering Estimate	2.49E-02
Solidification	10,120	lb/yr	0.0192	lb/ton	Engineering Estimate	4.86E-05
Gas Tank	9,927	gal/yr	0.66	wt % VOC	AP-42 Sec 7.1	2.30E-04
Bioremediation	24,440	lb/yr	0.0259	lb/ton	Engineering Estimate	1.58E-04
Bioremediation	62,060	lb/yr	0.0148	lb/ton	Engineering Estimate	2.30E-04
Bioremediation	257,480	lb/yr	0.0132	lb/ton	Engineering Estimate	8.50E-04
Bioremediation	440	lb/yr	1.98	lb/ton	Engineering Estimate	2.18E-04
Total						**0.25**
Toxaphene						
Macro Encapsulation	513,908	lb/yr	0.00746	lb/ton	Engineering Estimate	**9.58E-04**
Trichloroethylene						
ORU LFG	245.5	MMscf/yr	2.42E-03	lb/MMscf	Engineering Estimate	2.97E-04
Waste Handling/Inspection	1,944,282	lb/yr	0.0000261	lb/ton	Engineering Estimate	1.27E-05
Landfill	1,944,282	lb/yr	0.0000547	lb/ton	Engineering Estimate	2.66E-05
Macro Encapsulation	2,022,186	lb/yr	0.00208	lb/ton	Engineering Estimate	1.05E-03
Stabilization	652,380	lb/yr	0.0711	lb/ton	Engineering Estimate	1.16E-02
Solidification	33,730	lb/yr	0.0594	lb/ton	Engineering Estimate	5.01E-04
Bioremediation	87,120	lb/yr	0.0134	lb/ton	Engineering Estimate	2.92E-04
Bioremediation	440	lb/yr	1.03	lb/ton	Engineering Estimate	1.13E-04
Total						**1.39E-02**
Triethylamine						
Waste Handling/Inspection	52,716	lb/yr	0.006	lb/ton	Engineering Estimate	7.91E-05
Landfill	52,716	lb/yr	0.00903	lb/ton	Engineering Estimate	1.19E-04
Solidification	52,716	lb/yr	8.42	lb/ton	Engineering Estimate	1.11E-01
Total						**1.11E-01**
Vinyl Acetate						
Waste Handling/Inspection	2,200	lb/yr	0.00827	lb/ton	Engineering Estimate	4.55E-06
Landfill	2,200	lb/yr	0.0407	lb/ton	Engineering Estimate	2.24E-05
Total						**2.69E-05**
Vinyl chloride						
ORU LFG	245.5	MMscf/yr	2.82E-03	lb/MMscf	Engineering Estimate	**3.46E-04**
Waste Handling/Inspection	812,660	lb/yr	0.0000205	lb/ton	Engineering Estimate	4.16E-06

Compound/Emission Point	Operating Parameters		Emission Factor			Emissions ton/yr
			Rate		Reference	
Landfill	812,660	lb/yr	0.00189	lb/ton	Engineering Estimate	3.84E-04
Macro Encapsulation	2,376,652	lb/yr	0.00000397	lb/ton	Engineering Estimate	2.36E-06
Stabilization	3,080	lb/yr	0.000361	lb/ton	Engineering Estimate	2.78E-07
Solidification	10,120	lb/yr	0.192	lb/ton	Engineering Estimate	4.86E-04
Total						**1.22E-03**
Vinylidene Chloride						
Waste Handling/Inspection	103,000	lb/yr	0.0000769	lb/ton	Engineering Estimate	1.98E-06
Landfill	103,000	lb/yr	0.00206	lb/ton	Engineering Estimate	5.30E-05
Macro Encapsulation	511,640	lb/yr	0.00206	lb/ton	Engineering Estimate	2.63E-04
Stabilization	2,640	lb/yr	0.0063	lb/ton	Engineering Estimate	4.16E-06
Solidification	880	lb/yr	0.00000759	lb/ton	Engineering Estimate	1.67E-09
Total						**3.23E-04**
m,p-Xylenes						
Thermal Oxidizer (TOU-1)	20.5	MMscf/yr	2.50	lb/MMscf	Engineering Estimate	**0.03**
o-Xylenes						
Thermal Oxidizer (TOU-1)	20.5	MMscf/yr	0.97	lb/MMscf	Engineering Estimate	0.01
ORU LFG	245.5	MMscf/yr	1.15E-01	lb/MMscf	Engineering Estimate	1.41E-02
Concrete Crush Engines	7,941	MMBtu/yr	2.85E-04	lb/MMBtu	AP-42 Table 3.3-2	1.13E-03
Waste Handling/Inspection	1,670,200	lb/yr	0.146	lb/ton	Engineering Estimate	6.10E-02
Landfill	1,732,260	lb/yr	0.0000114	lb/ton	Engineering Estimate	4.94E-06
Macro Encapsulation	2,093,906	lb/yr	0.00252	lb/ton	Engineering Estimate	1.32E-03
Stabilization	651,060	lb/yr	0.142	lb/ton	Engineering Estimate	2.31E-02
Solidification	10,560	lb/yr	0.214	lb/ton	Engineering Estimate	5.65E-04
Gas Tank	9,927	gal/yr	0.05	wt % VOC	AP-42 Sec 7.1	1.74E-05
Bioremediation	24,440	lb/yr	0.0259	lb/ton	Engineering Estimate	1.58E-04
Bioremediation	62,060	lb/yr	0.0148	lb/ton	Engineering Estimate	2.30E-04
Bioremediation	440	lb/yr	1.98	lb/ton	Engineering Estimate	2.18E-04
Total						**0.11**
Zinc						
Propane Space Heater	1,400	gal/yr	0.00308	lb/Mgal	CATEF	**2.16E-06**
TOTAL HAP						**12.27**

9489.1994(01)

CLARIFICATION ON THE DISTINCTION BETWEEN THERMAL DESORBERS AND INCINERATORS

United States Environmental Protection Agency
Washington, D.C. 20460
Office of Solid Waste and Emergency Response

February 23, 1994

Mr. David D. Emery
President
Bioremediation Service, Inc.
P.O. Box 2010
Lake Oswego, Oregon 97035-0012

Dear Mr. Emery:

This is in response to your December 21, 1993, letter requesting clarification on the distinction between thermal desorbers and incinerators. In particular, you questioned whether temperature was a criterion for distinguishing between desorbers and incinerators and whether chlordane contaminated soil can be effectively and safely treated by thermal desorption.

Under the Environmental Protection Agency's (EPA's) regulations, thermal treatment units that are enclosed devices using controlled flame combustion and that are neither boilers nor industrial furnaces are classified as incinerators subject to regulation under 40 CFR Part 264, Subpart O. Definitions of boilers, industrial furnaces, and incinerators are established in 40 CFR 260.10. Thermal treatment units that do not use controlled flame combustion and that are not industrial furnaces are classified as "miscellaneous units" subject to regulation under 40 CFR Part 264, Subpart X.

The use of "controlled flame combustion" determines whether EPA regulates a device used for thermal desorption as an incinerator or a "miscellaneous unit". Consequently, a thermal desorber would be subject to regulation as an incinerator if it was equipped with a fired afterburner to destroy desorbed organic compounds, or if the desorption chamber was directly fired, irrespective of how the desorbed organics were controlled. On the other hand, if the desorption chamber was indirectly heated and the desorbed organics were not controlled using controlled flame combustion (e.g., no afterburner), the thermal desorber would be subject to regulation as a "miscellaneous unit". Thus, in response

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to your questions, temperature is not a criterion that is used to determine the regulatory status of a thermal desorber.

EPA's regulations for miscellaneous units are not prescriptive given the variety of devices that fall into this category. Rather, the regulations require the permitting official to establish permit conditions that are necessary to protect human health and the environment. For "miscellaneous" thermal treatment units, permit writers will generally require compliance with all of the Subpart O incinerator standards that are appropriate for the technology and then determine if additional controls are needed to ensure that emissions are safe.

Please note that I have described EPA's regulatory classification approach for thermal desorbers. Under the Resource Conservation and Recovery Act, EPA authorizes the States to implement the hazardous waste management regulatory program. State regulations may be more stringent or broader in scope than EPA's. Therefore, you should check with the State in which the facility in question is to be located to identify any applicable standards.

With respect to your question as to whether chlordane contaminated soil can be effectively and safely treated by low temperature desorption, you should contact EPA's technical expert on thermal desorption, Paul de Percin, Office of Research and Development, for assistance. Mr. de Percin can also be consulted about TCDD conjugation but, without full thermodynamic and kinetic data regarding the process involved, it may be difficult to give you any definitive assistance. He can be reached at 513-569-7797.

I hope that this information will be helpful. If you have further questions about the regulatory classification of thermal desorbers, please contact Bob Holloway of my staff at 703-308-8461.

Sincerely,
Michael Shapiro
Director
Office of Solid Waste

cc: Paul de Percin; Bob Holloway

RO 13657

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

WASHINGTON, D.C. 20460

OFFICE OF
SOLID WASTE AND EMERGENCY
RESPONSE

Mr. Parker E. Brugge
Patton Boggs, L.L.P.
2550 M Street, N. W.
Washington, D.C. 20037-1350

Dear Mr. Brugge:

This letter is in response to your April 7, 1998, letter seeking clarification on the distinction between thermal desorbers and incinerators. Under the U.S. Environmental Protection Agency (EPA) Resource Conservation and Recovery Act (RCRA) regulations (40 CFR 260.10), thermal treatment units that are enclosed devices using controlled flame combustion, and that are neither boilers nor industrial furnaces, are classified as incinerators subject to regulation under 40 CFR Part 264, Subpart 0. Thermal treatment units that do not use controlled flame combustion, and that are neither boilers nor industrial furnaces, are classified as "miscellaneous units" subject to regulation under 40 CFR Part 264, Subpart X.

EPA regulations do not define "thermal desorber", but the term generally applies to a unit that treats waste thermally to extract the contaminants from the matrix. A thermal desorber utilizing controlled flame combustion (e.g., equipped with a directly fired desorption chamber and/or a fired afterburner to destroy organics) would meet the regulatory definition of an incinerator. On the other hand, a thermal desorber that did not use controlled flame combustion (e.g., equipped with an indirectly heated desorption chamber and the desorbed organics were not "controlled"/destroyed with an afterburner) would be classified as a "miscellaneous unit".

With regard to the September 1993 Presumptive Remedy guidance entitled: `Presumptive Remedies: Site Characterization and Technology Selection for CERCLA Sites with Volatile Organic Compounds in Soils" (Directive Number 9355.0-48FS) that you mentioned, EPA identified thermal &sorption and incineration as the second and third preferred technologies, respectively. The intent of the guidance is that units that can be generally described as thermal desorbers, whether or not they are also incinerators, are second in the preference list. However, if a thermal desorber that meets the RCRA definition of incinerator is used to treat hazardous waste at a CERCLA site, the unit must meet RCRA's incinerator standards, EPA developed the preferential order set out in this guidance based on historical patterns of remedy selection and EPA's

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scientific and engineering evaluation of performance data on technology implementation. There was no intent implied or stated in the Presumptive Remedy guidance that the preferential order was based on the temperature of operation; the guidance does not limit the thermal desorbers technologies to those that are low-temperature thermal desorbers.

We appreciate that as technologies evolve, the distinctions between units often become blurred, and, in the case of thermal desorbers, may fail within two separate classifications depending on the design of the unit. Classification of a "thermal treatment" unit, however, is defined by 40 CFR 260.10.

Both the RCRA regulatory framework and the CERCLA remedy selection process provide adequate flexibility to ensure that the unit is operated in a protective manner and that there is adequate and informed public participation. If you have any further questions, please contact either Andrew O'Palko, Office of Solid Waste, at (703) 308-8646 or Robin Anderson, Office of Emergency and Remedial Response, at (703) 603-8747.

Sincerely,

Elizabeth Cotsworth
Acting Director
Office of Solid Waste

Sincerely,

Stephen D. Luftig
Director
Office of Emergency and Remedial Response

cc: Andrew O'Palko, OSW
Bob Holloway, OSW
Robin Anderson, OERR
Karen Kraus, OGC
Superfund Regional Response Managers
RCRA Senior Policy Advisors

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PATTON BOGGS, L.L.P.

2550 M STREET. N.W.
WASHINGTON. D.C. 20037-1350
(202) 457-6000 (202) 457-5225

April 2, 1998

Ms. Elizabeth A. Cotsworth
Acting Director
Office of Solid Waste
U.S. Environmental Protection Agency
401 M Street, S.W. (5301W)
Washington, D.C. 20460

Dear Ms. Cotsworth:

I am writing to seek clarification on the distinction between thermal desorbers and incinerators.

It is my understanding that thermal treatment units which are enclosed devices using controlled flame combustion, and that are neither boilers nor industrial furnaces, are classified as incinerators subject to regulation under 40 CFR Part 264, Subpart O. It is also my understanding that thermal treatment units which do not use controlled flame combustion, and that are not industrial furnaces, are classified as "miscellaneous units" subject to regulation under 40 CFR Part 264, Subpart X.

Thus, a thermal desorber is subject to regulation as an incinerator if it is equipped with a fired afterburner, or if the desorption chamber is directly fired. However, I would assume that, although such a device is subject to regulation under Subpart O, it nevertheless remains a "thermal desorber." The fact that it must meet the standards set forth in Subpart O for incinerators does not transform it somehow into an incinerator for CERCLA purposes.

For example, EPA issued guidance in September 1993 explaining that at a Superfund site which has soil contaminated with volatile organic compounds, the range of remedial technologies set forth in a Record of Decision may be soil-vapor extraction ("SVE"), low-temperature thermal desorption ("LTTD"), and incineration. The preferred order is SVE, LTTD, and, as a last resort, incineration. A thermal desorber with a fired afterburner, or one whose desorption chamber is directly fired, must fall within the "thermal desorption" family of technologies, even though it would be subject to regulation under Subpart O as an incinerator.

To hold otherwise would disqualify the large majority of LTTD units, which are directly fired and use afterburners for air pollution control. This result would be contrary to EPA's CERCLA guidance and to the Administrator's emphasis on reducing incineration which involves the high-temperature burning of contaminated soil.

There appears to be some confusion on this issue, for which we would appreciate your help in clarifying. Please call me if you have any questions or if you would like to discuss this issue further.

Sincerely,

Parker E. Brugge

cc: Bob Holloway

State of Oregon
Department of
Environmental
Quality

Organic Recovery Unit #2
Design and Operations Plan

For

Chemical Waste Management of the Northwest, Inc.

Arlington Facility • ORD 089 452 353
17629 Cedar Springs Lane
Arlington, Oregon

Standalone Document No. 22

This document is issued by the
Oregon Department of Environmental Quality

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LIST OF APPENDICES

| - ORGANIC RECOVERY UNIT #2

1.1 Introduction

This *Organic Recovery Unit #2 Design and Operations Plan* (Plan) establishes the design and operating standards for the Bioremediation and the Organic Recovery Unit (ORU) treatment processes.

1.2 Purpose

- To ensure compliance with all aspects of Organic waste treatment under 40 CFR §264 subparts AA,BB, and CC air emissions standards and;,
- To ensure treatment standards are achieved for all treated wastes per 40 CFR §268.40.

1.1.1 Organic Recovery Unit ORU-2

CWMNW operates two Organic Recovery Units (ORU), designated ORU-1 and ORU-2. Both ORU treatment systems are located adjacent to Containment Building B-5. ORU-1 received approval to operate in 2010 and has been operating since that time. ORU-1 is covered under *Standalone #19 – Bioremediation and Organic Recovery Unit Design and Operations Plan.*

ORU-2 was constructed and commissioned in 2016, The ORU-2 treatment unit treats listed and/or characteristic hazardous wastes using an indirect fired thermal process to reduce listed and/or characteristic hazardous wastes to the levels specified in 40 CFR Part 268. Secondary treatment methods may be required to reduce the treated listed and/or characteristic hazardous wastes to the levels specified in 40 CFR Part 268 prior to land disposal. Wastes accepted for treatment through the ORU-2 treatment system are staged inside Building B-5 and in approved containers in outside storage areas. Post-treatment solids awaiting LDR clearance or further treatment are temporarily stored in piles inside Building B-4 or B-5.

1.3 ORU-2 Treatment System

ORU-2 material handling conveyers receive material from two feed hoppers and convey the media to be treated to the ORU treatment unit. System feed conveyors are fully enclosed and ventilated to the thermal oxidizer. The ORU-2 system consists of a double pass rotary furnace that indirectly heats the media traveling through the inside of the rotary tube, and the treated media discharges at the feed end of the unit. System components subject to freezing are heat traced and insulated to prevent freezing. As-built design plans for the ORU-2 are contained in Appendix A.

1.4 Wastes Approved for Treatment

ORU-2 physically treat media with organic contamination. The following table illustrates the general waste families and possible associated RCRA Codes being treated by the system.

Table 19-1: ORU Approved Waste Codes

APPROVED EPA CODES
D001, D002, DOO3, D004, D005, D006, D007, D008, D009, D010, D011, D012, D013, D014, D015, D016, D017, D018, D019, D020, D021, D022, D023, D024, D025, D026, D027, D028, D029, D030, D031, D032, D033, D034, D035, DO36, D037, D038, D039, D040, F001, F002, F003, F005, F034, F037, F038, K001, K048, K049, K050, K051, K052, K143, K169, K170, K171, K172, P037, P059, P089, U002, U019, U031, U036, U051, U052, U060, U061, U112, U129, U140, U154, U159, U161, U165, U188, U210, U220, U228, U239

The ORU Treatment systems are made up of several subsystems that include the feed systems, an indirect fired Anaerobic Thermal Desorption Unit (ATDU), ash handling systems, vapor condensing system, process water handling and treatment systems, and air emissions control systems. A process flow diagram for the various systems is contained in Appendix B.

1.5 Waste Segregation

The treatment of the wastes with codes in Table 19-1 through the ORU system may require the isolation of process residuals dependent on the EPA codes associated with the waste being treated. These incompatible wastes will be treated separately following a system change over. The system changeover process shall include the following tasks, all wastes in the feed system will be processed through the ATDU, all process water will be evacuated from the system and treated through the process water treatment system, and all sludges accumulated in the sludge removal system will be removed and stored in accordance with the WAP. Evacuated residual sludges and process waters will be treated and/or managed in accordance with the WAP.

|- ORU-2 SYSTEM OVERVIEW

2.1 Anaerobic Thermal Desorption Unit

The system is designed to separate the organic constituents from contaminated media in such a manner that they are preserved for collection and recycling. The Anaerobic Thermal Desorption Unit (ATDU) includes a rotating cylinder that is slightly inclined downward from the product feed end. This rotating cylinder is enclosed within an outer shell, within which heat is applied to the outside of the rotating cylinder. Either Landfill Gas or Propane will be used to fire the ATDU. Wastes inside the ATDU do not directly contact the heat source, and an inert atmosphere is maintained in the cylinder to prevent oxidation of the organic constituents. The indirectly heated cylinder vaporizes water and organics contained in the waste. The primary heat transfer mechanism is conduction through the cylinder wall.

2.2 ATDU Operating Conditions

The ATDU rotating cylinder operates under an inert anaerobic atmosphere, thereby preventing any oxidation or destruction of the hydrocarbon or chemical constituents. The inert anaerobic atmosphere is maintained during start-up and shutdown by purging the ATDU with steam to displace the oxygen. During normal operations, the water content of the feedstock is typically sufficient to generate enough water vapor to maintain the inert atmosphere inside the desorber and additional steam is therefore not required. The seals at the inlet and discharge ends of the rotary drum combined with the double tipping valve airlocks at either end maintain a non-oxidizing atmosphere in which the waste can be safely vaporized.

An oxygen sensor connected to the SCADA control system is installed in the discharge end of the ATDU continuously monitors the oxygen concentration within the rotary drum which during normal operations is typically below 1 percent. The SCADA control system the oxygen sensor measures the oxygen concentration inside the drum, in the event the oxygen level increases above 1 percent, steam can be added to reduce the oxygen concentration down to normal levels. In the event the oxygen level rises above 5 percent this would constitute a malfunction condition, the SCADA system will automatically shut down the burners and stop feed into the ATDU.

2.3 ATDU Shutdown Strategy

The system is shutdown employing three scenarios; these are Normal. Malfunction, and Emergency scenarios. The following is a discussion for each scenario;

2.3.1 Emergency Shutdown

Emergency shutdowns are required for

- Feed to the ATDU system is shutdown, feed conveyor system are shutdown
- Burners shutdown
- ATDU shutdown.
- Thermal Oxidizer bypass valve set to open
- Thermal Oxidizer is shutdown

2.3.2 Normal Plant Shutdown

The normal shutdown procedure involves shutting down equipment from the feed end of the unit down through the discharge equipment, allowing adequate time for each conveyor or piece of equipment to fully discharge before proceeding to the next item. The rotary drum will be allowed to cool before drum rotation is stopped. During this cooldown period steam is added to ensure the anaerobic atmosphere inside the ATDU is maintained. After the unit has cooled the vapor recovery and ancillary support systems are shut down. Finally, the thermal oxidizer system is shutdown

2.3.3 Shutdown due to Malfunction

The ATDU system is programmed with both software and hardwired process interlocks to ensure components shut down automatically upon the failure or malfunction of any critical piece of process equipment. Failure of the system to maintain proper combustion in the furnace, process conditions in the ATDU or thermal oxidizer, or a failure of the material handling equipment downstream of the ATDU will cause the system to automatically switch off the combustion system, stop the feed of material into the unit. Should the malfunction involve the thermal oxidize, the system, will divert process vapors away from the thermal oxidizer until the upset condition can be remedied.

2.3.4 Emergency Plant Shutdown

Hardwired interlocks will initiate an emergency shutdown upon loss of primary electrical power, high oxygen concentration inside the ATDU or a runaway stack temperature in the ATDU furnace or Thermal Oxidizer Unit. Redundant gas safety valves installed on each burner spring fail closed if there is any loss in the numerous permissive conditions or interlocks that allow their opening. Feed to the plant is stopped automatically. In certain cases, the thermal oxidizer will remain running but should the emergency condition involve the thermal oxidizer, the system will divert process vapors away from the thermal oxidizer until the upset condition can be remedied. An uninterruptible power supply (UPS) supports the control system to allow the operator to monitor the system shutdown in the event of complete power loss.

2.4 Feed Systems

A below grade mixing hopper south of contaminant Building B5 receives untreated medias, moisture conditions them if necessary and feeds the waste through a series of conveyors to the ATDU for thermal separation. If desired this mixing hopper feed system can also pile the moisture conditioned media inside Building B-5 allowing for storage of the media inside the building. A second feed hopper inside the building is loaded by mechanical methods, the hopper feeds a debris screen which removes materials meeting the definition of debris contained in 40 CFR 268.45 from the waste. Oversize media separated by the screening system is classified as debris and is stored on the floor in containment Building B-5 for delivery to other treatment methods in accordance with Standalone #11 - *Debris Treatment Plan*. The undersize media is then fed through a series of conveyors to the ATDU for thermal separation. An arrangement of airlocks ensure that oxygen is not able to enter the unit during the process operation. The ORU Feed Systems are designed to maintain compliance with 40 CFR 61, Subpart FF (Benzene Waste Operations NESHAP, or BWON) control and treatment standards to manage BWON subject materials when required.

2.5 Treated Ash Systems

The ORU vaporizes organic contaminants contained in media and produces a treated ash that is cooled through jacketed cooling conveyors. A series of transfer conveyors route the processed solids to several separate discharge points in Building B-4, each discharge point will be used to create piles inside the containment building approximately 250 tons in size. Ash may also be stored in containment Building B-5 or in approved containers prior to disposal or further treatment. The ash from the treatment process can be landfilled once the waste meets LDR limits in 40 CFR 268.7. Ash that does not meet the constituent specific LDRs is further treated and cleared before disposal. Confirmation testing is completed in accordance with Standalone #1- *Waste Analysis Plan*.

2.6 Vapor Recovery System

The organic vapors and water are gasified inside the rotating cylinder, and conveyed to a condensing system. The condensing system uses process water to quench the organic vapors. Once quenched the resulting quench water is separated into an organic fraction and a water fraction. The organic fraction separated from the treated wastes can be generally classified in two categories;

2.6.1 Petroleum Fractions

The condensed and separated organic fraction for wastes with recoverable petroleum fraction is not regulated according to 40 CFR 261.6(a)(3)(iv)(C), and is transferred to one of three product storage tanks in the tank farm area. Organic fraction product for these wastes is recycled as a commodity depending on makeup.

2.6.2 Non-Petroleum Fractions

The condensed organic fraction for wastes without recoverable petroleum fractions is subject to the disposal requirements contained in 40 CFR 268 and are managed in accordance with *Standalone #1 – Waste Analysis Plan*. The condensed organic fraction is transferred as process water to the water treatment system in the tank farm area.

2.7 Settled Solids

Settled solids which accumulate in the vapor recovery sump are conveyed out of the sump into a closed hopper. These accumulated solids may be reintroduced back into the ORU feed system for treatment using pumps or mechanical means. In some cases, a centrifuge may be used to dewater these solids for shipment offsite for additional treatment. Liquids separated in the centrifuging process are introduced back into the process water for reuse and/or final treatment.

2.8 Process Water System

Reclaimed commodities are separated from the process water fraction in the oil water separator. Process water is recycled back into the system, and any residual water condensed out of the incoming waste is stored in the process water tank. Residual process water is transferred to surge tanks in the tank farm area. Process water is treated through an onsite water treatment system in the tank farm area with sand and carbon filtration. Chemical treatment prior to filtration may be required for some waste streams. Treated process water meeting LDR

requirements may be reused for moisture conditioning of wastes in the solidification and stabilization process, or sent to the facilities solar evaporation ponds.

2.9 Air Emission Controls

Any residual non-condensable organic vapors are passed through a thermal oxidizer for complete destruction. The thermal oxidizer operation and performance is regulated by the facilities ACDP permit.

- ORU-2 SYSTEM TANKS

The following twenty-one (21) tanks are used in the ORU treatment system. Tank numbers listed below coincide with tank numbers provided on the flow diagram in Appendix B. All hazardous waste storage tanks associated with the ORU treatment system are managed in accordance with Standalone #8 – *Bulk Storage Plan*.

Table 22-3: ORU-2 Tank Listing

TANK #	DESCRIPTION	TYPE	CAPACITY (Gal)
RCRA Tanks			
F-1301	Interceptor	Above ground, horizontal, flat bottom, CS	3,000
F-1401	Oil Water Separator	Above ground, horizontal, cone bottom, CS	13,200
F-1402	Process Water Tank	Above ground, vertical, cone bottom, CS	20,000
F-1403	Process Water Mix Tank 1	Above ground, vertical, cone bottom, CS	20,000
F-1404	Process Water Mix Tank 2	Above ground, vertical, cone bottom, CS	20,000
F-1405	Treated Process Water Tank 1	Above ground, vertical, cone bottom, CS	20,000
F-1406	Treated Process Water Tank 2	Above ground, vertical, cone bottom, CS	20,000
F-1407	Treated Process Water Tank 3	Above ground, vertical, cone bottom, CS	20,000
F-1408	Treated Process Water Tank 4	Above ground, vertical, cone bottom, CS	20,000
F-1409	Treated Process Water Tank 5	Above ground, vertical, cone bottom, CS	20,000
F-1410	Treated Process Water Tank 6	Above ground, vertical, cone bottom, CS	20,000
F-1411	Treated Process Water Tank 7	Above ground, vertical, cone bottom, CS	20,000
F-1412	Treated Process Water Tank 8	Above ground, vertical, cone bottom, CS	20,000
F-1413	Treated Process Water Tank 9	Above ground, vertical, cone bottom, CS	20,000
F-1414	Treated Process Water Tank 10	Above ground, vertical, cone bottom, CS	20,000
F-1415	Treated Process Water Tank 11	Above ground, vertical, cone bottom, CS	20,000
F-1416	Treated Process Water Tank 12	Above ground, vertical, cone bottom, CS	20,000
ME-1101	Mix Hopper A	Above Ground Mix/Feed Hopper, CS	7,473
ME-1102	Feed Hopper B	Above Ground Feed Hopper	1,742
V-1401A	Sand Filter A	Above Ground Sand Filter A	100
V-1401B	Sand Filter B	Above Ground Sand Filter B	100
V-1402	Carbon Filter	Stainless Steel	3,950
Non-RCRA Tanks			
F-1417	Product Tank 1	Above ground, vertical, cone bottom, CS	20,000
F-1418	Product Tank 2	Above ground, vertical, cone bottom, CS	20,000
F-1419	Product Tank 3	Above ground, vertical, cone bottom, CS	20,000

- SYSTEM SECONDARY CONTAINMENT

The ORU-2 System containment is made up of 5 separate containment systems as listed below:

Table 22-4: ORU-2 System Containment

Site Plan Identifier	Area Description	Construction	Required Containment	Actual Containment
C	ORU System Equipment	Reinforced Concrete	3,739.3 ft^3	4,101.3 ft^3
B3	Product Tank Storage	Reinforced Concrete	2,948.6 ft^3	3,152.5 ft^3
B2	Process Water Treatment Area	Reinforced Concrete	2,932.1 ft^3	3,502.5 ft^3
B1	Treated Water Storage	Reinforced Concrete	3,433.3 ft^3	6,265.2 ft^3
D	Mixing Hopper Vault	Reinforced Concrete	1,018.4 ft^3	9,781.3 ft^3
A	Truck Offload Area	Reinforced Concrete	120 ft^3	159.8 ft^3

All ORU-2 containment areas are designed to meet the requirements contained in 40 CFR §264.193. 40 CFR §264.193(e)(2) requires that the secondary containment areas be large enough to contain the capacity of the largest tank plus precipitation from a 25-year, 24-hour storm, (refer to Appendix C for containment calculations). All joints in containment slabs are constructed with chemical-resistant waterstops meeting the requirements of 40 CFR §264.193(e)(2)(iii)). The slab is coated with a chemically compatible impermeable coating meeting the requirements of 40 CFR §264.193(e)(2)(iv)). Stormwater collected from the sumps in these containment areas will be pumped to the process water system and ultimately treated through the process water treatment system. The P.E. certification of the containment structures and tanks required by 40 CFR 264.192(b) will be maintained at the facility in the operating record.

- ORU-2 OPERATIONS

5.1 Organic Recovery Unit Contaminated Waste Handling

Following arrival and acceptance of the waste, the wastes are either stored in approved storage areas or fed directly into the treatment system through two feed hoppers in the system.

5.2 Subpart CC Waste Handling

Wastes subject to Subpart CC Level 1 controls will be stored or accepted in roll-off boxes and dump type vehicles may be placed on the slab floor in Containment Building B-5. Wastes subject to Subpart CC Level 2 controls will remain in the Level 2 shipping containers in accordance with Standalone # 9 - *Container Storage Design and Operations Plan* until they are transferred to the ORU-2 outside mixing feed hopper and amended with drying agents as necessary. Wastes with higher moisture contents may also be mixed with dryer materials in the mixing feed hopper or inside Building B-5 to attain appropriated moisture content.

5.3 Subpart FF Waste Handling

CWMNW tracks the facility's Total Annual Benzene (TAB) and it has historically been less than 1 Mg; therefore, CWMNW is not subject to controls in Subpart FF. However, in the event that generators require their specific wastes to be managed under controls, wastes subject to 40 CFR 61, Subpart FF may be handled in controlled containers such as roll off boxes until the material is transferred into the ORU-2 mixing feed hopper. These wastes will be maintained in containers that meet BWON control requirements, and shall be inspected and monitored in order to comply with all related standards. The vapors throughout the ORU feed system are routed through closed-vent systems to control devices, and all the equipment and piping lines are subject to BWON inspection and monitoring requirements.

5.4 Waste Preparation for Organic Recovery

In general, waste preparation improves the ability of the ORU-2 to treat the contaminated waste. This preparation includes specific operations for screen sizing and size reduction that are also dependent on the uniformity, moisture, and liquid content of the incoming contaminated waste.

Screening (vibrating or non-vibrating) is a primary operation, and wastes are screened or strained to remove debris. Blending low and high concentration waste or high and low boiling point wastes optimizes the operation and reduces problems in liquids recovery.

5.5 Organic Recovery Unit Treatment Capacity ORU-2

The indirect-fired ATDU has an ultimate design capacity of 30 million British thermal units (30 MMBtu), and a theoretical heat transfer efficiency of 60-percent. The temperature capacity of the system is 1,200°F. The actual operating temperatures vary depending upon the boiling points of the organic constituents being extracted such that optimal fuel consumption is maintained.

The theoretical treatment capacity of the system (tons/hour) depends primarily upon the moisture content of the waste and the thermal capacity of the ATDU. Appendix D provides the estimated treatment capacity of the system running at 900° F, based upon the moisture content of incoming waste, and using a thermal transfer efficiency of 60-percent.

| - ORU-2 REGULATORY STANDARDS

6.1 Organic Recovery Unit - 40 CFR Part 264 Subparts J/X Compliance

6.1.1 40 CFR Part 264, Subpart J Compliance

The ORU contains process water tanks that store and/or treat hazardous waste and are subject to 40 CFR Part 264, Subpart J. These tanks are managed in compliance with Standalone #8 - *Bulk Storage Plan*, which contains requirements for inspection and operation of these tanks. The hazardous waste storage tank systems in both of the ORU systems have been adequately designed, have sufficient structural integrity, and are acceptable for storing hazardous waste. Required engineer's certifications are contained in Standalone #8 - *Bulk Storage Plan*. Further, the tanks are provided with sufficient secondary containment meeting the requirements of 40 CFR 264.193. Containment calculations for the system are shown in Appendix C. All tanks associated with the ORU are included in Standalone #8 - *Bulk Storage Plan*, which includes all permitted RCRA tanks at the facility.

In the event of any leak or spill from a tank system or secondary containment system, the facility shall comply with response requirements per 40 CFR 264.196. Closure and post-closure care of the hazardous waste tank systems are discussed in Standalone #5 – *Closure/Post-Closure Plan*.

6.1.2 40 CFR Part 264, Subpart X Compliance

The ORU-2 treatment system contains a thermal desorption unit (TDU) and shaker screen equipment that is subject to 40 CFR Part 264, Subpart X. These miscellaneous units are most similar to tank systems; and thus, the applicable and appropriate provisions of 40 CFR Part 264, Subpart J shall be complied with to ensure protection of human health and the environment. Standalone #23 – Subpart X units includes these pieces of equipment.

6.2 Routine Tank Inspections

The elements and frequency of routine inspections of ORU-2 systems hazardous waste tanks, piping and containment are included in Standalone #3 - *Inspection Plan*. The tanks and piping shall be inspected for visible leaks and general condition. The overfill alarm systems shall be tested to insure they are in working order. The containment area and sumps shall be inspected for evidence of any liquid collection and evidence of any leakage from the associated pipes, pumps, tanks and equipment contained within the area. An inspection form for both the ORU systems tanks, piping and containment is contained in Standalone #3 - *Inspection Plan*.

6.3 RCRA Subparts AA, BB and CC and Benzene NESHAPS - Applicability and Compliance for Organic Recovery Systems

6.3.1 40 CFR Part 264, Subpart AA Applicability

40 CFR Part 264, Subpart AA defines the air emission standards for process vents associated with distillation, fractionation, thin-film evaporation, solvent extraction, or air or steam stripping operations. ORU-2 does not contain any distillation, fractionation, thin-film evaporation, solvent

extraction, or air or steam streaming operation; and thus, 40 CFR Part 264, Subpart AA does not apply to either ORU Treatment system and subsystems.

6.3.2 40 CFR Part 264, Subpart BB Applicability and Compliance

ORU-2 systems are subject to the requirements of 40 CFR Part 270; and thus, all equipment that contains or contacts hazardous waste with organic concentrations of at least 10 percent by weight is subject to 40 CFR Part 264, Subpart BB. Compliance requirements for 40 CFR Part 264, Subpart BB is discussed in the Organic Recovery Unit Controls and Monitoring section below

6.3.3 40 CFR Part 264, Subpart CC Applicability

The requirements of 40 CFR Part 264, Subpart CC apply to owners and operators of all facilities that treat, store, or dispose of hazardous waste in tanks, surface impoundments, or containers subject to 40 CFR Part 264, Subparts I, J, or K. As discussed in Section 3.6.1, the ORU does contain hazardous waste storage tanks subject to 40 CFR Part 264, Subpart J; however, per 40 CFR 264.1080(b)(7), the requirements of 40 CFR Part 264, Subpart CC do not apply to a hazardous waste management unit that the owner or operator certifies is equipped with and operating air emission controls in accordance with the requirements of an applicable Clean Air Act regulation codified under 40 CFR Part 60, Part 61, or Part 63. All hazardous waste storage tanks in the ORU are equipped with and operate with air emission controls in accordance with 40 CFR Part 61, Subpart FF; and thus, the hazardous waste storage tanks in the ORU are not subject to 40 CFR Part 264, Subpart CC. All 40 CFR Part 264, Subpart CC requirements, if any, are contained in the facilities ACDP Permit.

Subpart CC regulations are applicable to containers which are not handled in accordance with 40 CFR Part 61, Subpart FF, having a design capacity greater than 0.1 m^3 (approximately 26 gallons), and containing hazardous waste that has an average volatile organic (VO) concentration greater than 500 ppm by weight (ppmw) at the point of waste generation. Waste received at the facility for ORU treatment will typically arrive or be placed in containers that are larger than the exempted capacity and may contain hazardous waste with VO concentrations greater than 500 ppmw. CWMNW complies with Subpart CC container standards as provided in the Permit and Standalone # 9 - *Container Storage Design and Operations Plan*. In addition, the waste in any container is unloaded in an expedient manner to minimize potential organic air emissions. If, for any reason, unloading of the contaminated waste does not commence immediately, the container is to be kept covered with a lid that meets Subpart CC Level 1 controls. The lid or cover forms a continuous barrier over the entire surface area with no visible cracks, holes, gaps or other open spaces.

6.3.4 40 CFR Part 61, Subpart FF Applicability and Compliance

The ORU at certain times is subject to 40 CFR Part 61, Subpart FF (BWON), since it is part of a facility that intermittently treats, stores, and disposes of BWON wastes from chemical plants and petroleum refineries where the regulation does apply. CWMNW tracks the facility's Total Annual Benzene (TAB), and has historically been less than 1 Mg. Therefore, CWMNW facility is not subject to controls in Subpart FF. However, should the generator require their specific wastes be managed under controls, wastes subject to 40 CFR 61, Subpart FF may be handled in controlled containers such as roll off boxes until the material is loaded into the mixing feed hopper. These wastes shall be maintained in containers that meet BWON control requirements,

and shall be inspected and monitored as to comply with all related standards. The vapors throughout the ORU-2 feed system are routed through closed-vent systems to control devices, and all the equipment and piping lines are subject to BWON inspection and monitoring requirements.

All fixed-roof tanks shall have no detectable emissions in accordance with Method 21 standards and must be closed and sealed unless it is opened for sampling, inspections, maintenance, repair or removal of the waste. All organic vapors that are vented shall be maintained in a closed-vent system that routes to the thermal oxidizer control device.

In instances where the tank is venting to the atmosphere by a pressure relief device, these devices must remain in closed, sealed positions during normal operations. They may be opened if it is necessary to prevent damage or permanent disfiguration to tank, during filling or emptying, or during malfunctions. This follows the alternative standard for tanks under 40 CFR 61.351, allowing tanks handling primarily organic material to have only a pressure relief device.

The oil water separator in the ORU system is vented to the closed vent system and to the thermal oxidizer control device.

- ORU-2 CONTROLS AND MONITORING

The entire ORU-2 unit is centrally-monitored and controlled using a SCADA control package. The computer-based process controls provide graphic screens for effective plant control, monitoring, and data storage. The ORU-2 SCADA control system allow real-time access to all key plant parameters, and records the required operating parameters for compliance with the Part B permit and the ACDP permit. The demonstrated compliance SCADA system records the following parameters:

- Monitoring point CP1 - TDU Flue gas temperature - Deg F
- Monitoring point CP2 - TDU Syngas temperature - Deg F
- Monitoring point CP3 – TDU Infeed rate - TPH
- Monitoring point CP4 - Thermal oxidizer chamber temperature - Deg F
- Monitoring Point CP5 - Thermal oxidizer feed valve position – Open/Closed

The SCADA process controls enable the operator to improve system capacity, optimize fuel consumption, and protect the system against accidental malfunctions. The computerized system includes automatic fail safes for controlled shutdown of the system during upsets.

The process instrumentation and electrical switch gear is housed in a motor control center. The SCADA control system and operators control station is located in the control room south of the thermal processing system. Plant operators are trained in the operational and maintenance aspects of the system and these requirements are contained in Standalone #2 - *Security Procedures, Hazard Prevention, and Training Plan.*

7.1 Control Device Monitoring

The emissions control devices throughout the ORU system require monitoring of several different parameters, and the requirements for these are established in the facilities ACDP permit. The facility shall manage leaks identified by regular inspections in compliance with the requirements in 40 CFR Part 264.1064.

7.2 Tank Monitoring

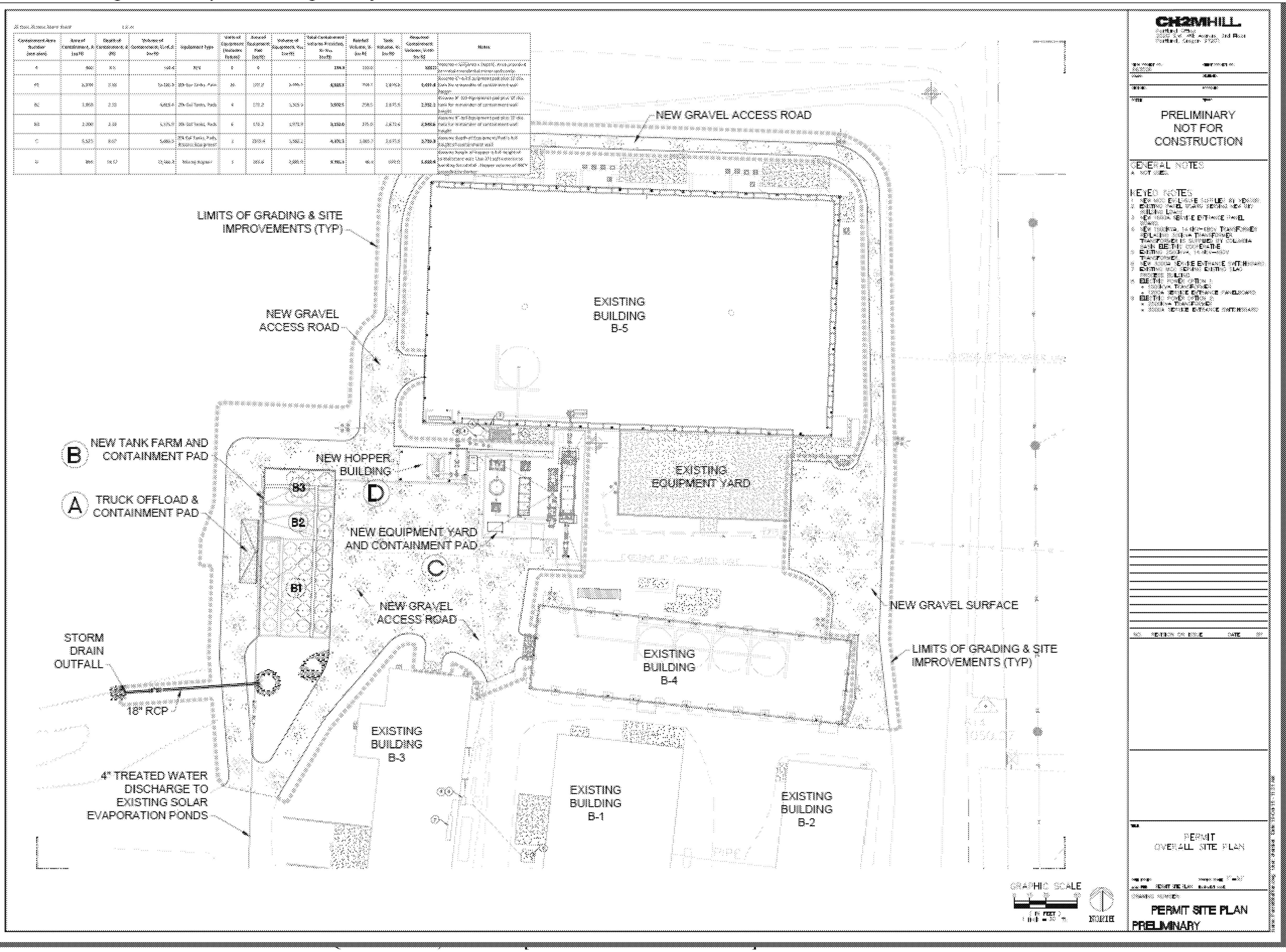
As indicated in Section 3.6.3, all hazardous waste storage tanks in the ORU-2 system are equipped with and operate with air emission controls in accordance with 40 CFR Part 61, Subpart FF; and thus, the hazardous waste storage tanks in the ORU-2 system are not subject to 40 CFR Part 264, Subpart CC. The facility shall comply with all applicable requirements under 40 CFR Part 61, Subpart FF. All hazardous waste tanks are equipped with a fixed roof cover and shall be visually inspected by the owner and operator quarterly, and monitored via Method 21 annually. If leaks are detected, responses and recordkeeping shall be made in compliance with 40 CFR Part 264, Subpart BB and 40 CFR 264.1064.

7.3 Other Equipment Monitoring

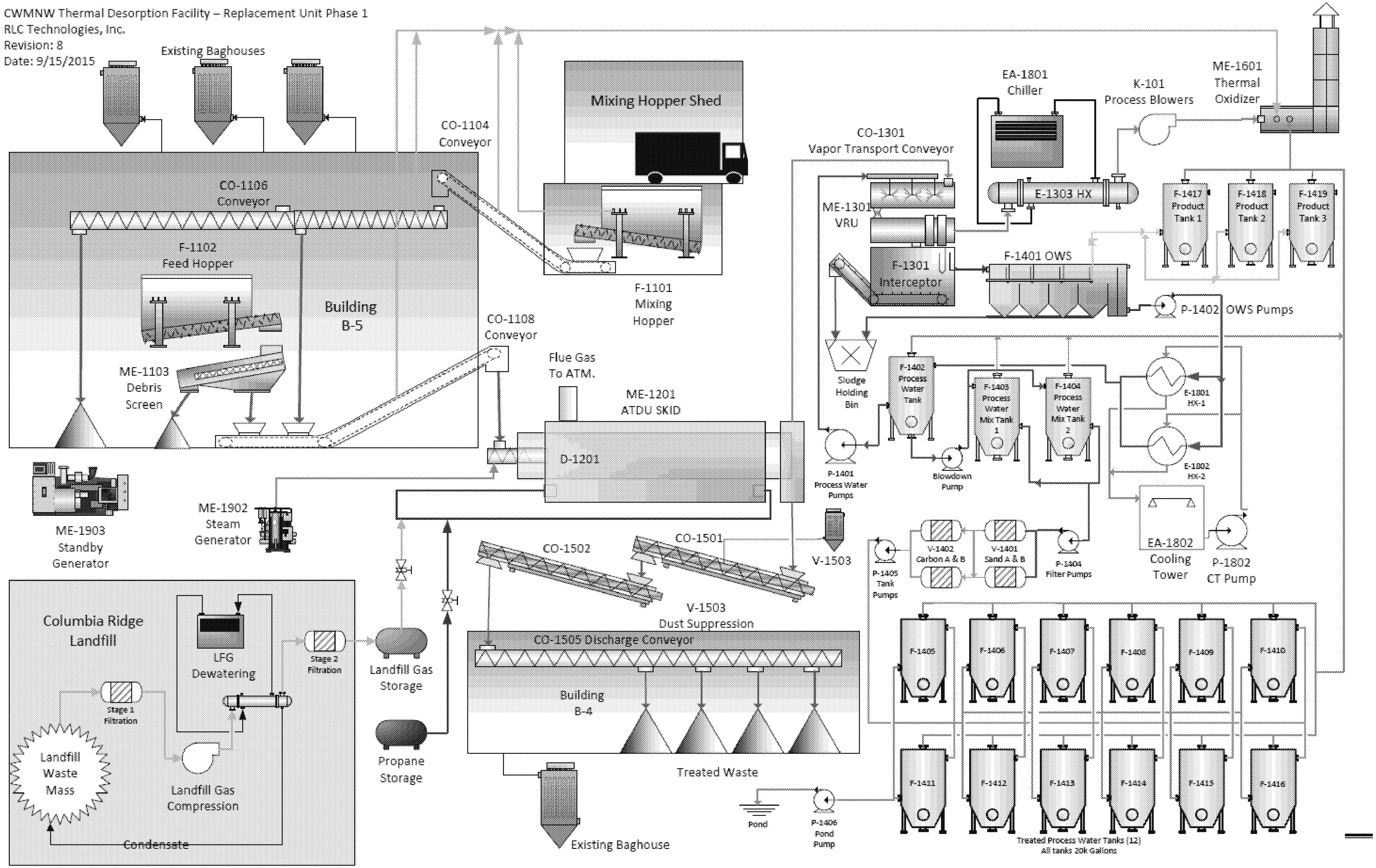
The ORU-2 is in heavy liquid service, and all pumps, valves, and pressure relief devices shall be observed for potential leaks using the following methods: Audible, Visual, and Olfactory (AVO), per 40 CFR Part 264, Subpart BB. There is no stated monitoring frequency for equipment in heavy liquid service according to 40 CFR Part 264, Subpart BB; however, monitoring shall be conducted quarterly consistent with industry best management practices, and to satisfy the BWON quarterly visual inspection requirements. When a leak is discovered, 40 CFR Part 60, Method 21 shall be used to measure the severity.

All sampling stations within ORU-2 system shall be built and kept up to design and installation requirements in order to stay compliant with 40 CFR, Subpart BB. All operational open-ended lines or pipes shall have a cap, plug, or double valve system when not in use.

APPENDIX A
AS-BUILT DESIGN PLANS FOR ORU-2


CH2MHILL
PRELIMINARY
NOT FOR
CONSTRUCTION
GENERAL NOTES
KEYED NOTES
NEW GRAVEL ACCESS ROAD
LIMITS OF GRADING & SITE
IMPROVEMENTS (TYP)
EXISTING
BUILDING
B-5
NEW GRAVEL
ACCESS ROAD
B
NEW TANK FARM AND
CONTAINMENT PAD
NEW HOPPER
BUILDING
D
A
TRUCK OFFLOAD &
CONTAINMENT PAD
B3
B2
B1
EXISTING
EQUIPMENT YARD
NEW EQUIPMENT YARD
AND CONTAINMENT PAD
C
NEW GRAVEL
ACCESS ROAD
NEW GRAVEL SURFACE
STORM
DRAIN
OUTFALL
18" RCP
EXISTING
BUILDING
B-4
LIMITS OF GRADING & SITE
IMPROVEMENTS (TYP)
EXISTING
BUILDING
B-3
4" TREATED WATER
DISCHARGE TO
EXISTING SOLAR
EVAPORATION PONDS
EXISTING
BUILDING
B-1
EXISTING
BUILDING
B-2
GRAPHIC SCALE
NORTH
PERMIT
OVERALL SITE PLAN
PERMIT SITE PLAN
PRELIMINARY

APPENDIX B
PROCESS FLOW DIAGRAM


CWMNW Thermal Desorption Facility – Replacement Unit Phase 1
RLC Technologies, Inc.
Revision: 8
Date: 9/15/2015
Existing Baghouses
Mixing Hopper Shed
CO-1104 Conveyor
CO-1106 Conveyor
F-1102 Feed Hopper
Building B-5
ME-1103 Debris Screen
CO-1108 Conveyor
F-1101 Mixing Hopper
Flue Gas To ATM.
ME-1201 ATDU SKID
D-1201
CO-1301 Vapor Transport Conveyor
ME-1301 VRU
F-1301 Interceptor
EA-1801 Chiller
E-1303 HX
K-101 Process Blowers
ME-1601 Thermal Oxidizer
F-1417 Product Tank 1
F-1418 Product Tank 2
F-1419 Product Tank 3
F-1401 OWS
P-1402 OWS Pumps
Sludge Holding Bin
F-1402 Process Water Tank
F-1403 Process Water Mix Tank 1
F-1404 Process Water Mix Tank 2
E-1801 HX-1
E-1802 HX-2
P-1401 Process Water Pumps
Blowdown Pump
EA-1802 Cooling Tower
P-1802 CT Pump
V-1402 Carbon A & B
V-1401 Sand A & B
P-1404 Filter Pumps
P-1405 Tank Pumps
ME-1903 Standby Generator
ME-1902 Steam Generator
CO-1502
CO-1501
V-1503
V-1503 Dust Suppression
CO-1505 Discharge Conveyor
Building B-4
Treated Waste
Existing Baghouse
Columbia Ridge Landfill
LFG Dewatering
Stage 2 Filtration
Stage 1 Filtration
Landfill Waste Mass
Landfill Gas Compression
Condensate
Landfill Gas Storage
Propane Storage
F-1405
F-1406
F-1407
F-1408
F-1409
F-1410
F-1411
F-1412
F-1413
F-1414
F-1415
F-1416
Pond
P-1406 Pond Pump
Treated Process Water Tanks (12)
All tanks 20k Gallons

APPENDIX C
SECONDARY CONTAINMENT CALCULATIONS

25 Year, 25 Hour Storm Event *1.5 in*

Containment Area Number (see plan)	Area of Containment, A (sq ft)	Depth of Containment, d (ft)	Volume of Containment, V_c=A.d (cu ft)	Equipment Type	Units of Equipment (includes Future)	Area of Equipment Pad (sq ft)	Volume of Equipment, V_{eq} (cu ft)	Total Containment Volume Provided, V_c-V_{eq} (cu ft)	Rainfall Volume, V_r (cu ft)	Tank Volume, V_t (cu ft)	Required Containment Volume, V_r+V_t (cu ft)	Notes
A	960	0.5	159.8	N/A	0	0	-	159.8	120.0	-	120.0	Volume = 1/3[Area x Depth]. Area provided to contain incidental minor spills only.
B1	6,078	2.33	14,160.8	20k Gal Tanks, Pads	24	172.2	7,895.5	6,265.2	759.7	2,673.6	3,433.3	Assume 6"-tall Equipment pad plus 12' dia. tank for remainder of containment wall height
B2	2,068	2.33	4,818.4	20k Gal Tanks, Pads	4	172.2	1,315.9	3,502.5	258.5	2,673.6	2,932.1	Assume 6"-tall Equipment pad plus 12' dia. tank for remainder of containment wall height
B3	2,200	2.33	5,125.9	20k Gal Tanks, Pads	4	172.2	1,973.9	3,152.0	275.0	2,673.6	2,948.6	Assume 6"-tall Equipment pad plus 12' dia. tank for remainder of containment wall height
C	8,525	0.67	5,683.5	20k Gal Tanks, Pads, Process Equipment	1	2373.4	1,582.2	4,101.3	1,065.7	2,673.6	3,739.3	Assume depth of Equipment/Pad is full height of containment wall
D	894	14.17	12,666.3	Mixing Hopper	1	203.6	2,885.0	9,781.3	46.4	972.0	1,018.4	Assume height of hopper is full height of containment wall. Use 371 sqft exterior to building for rainfall. Hopper volume of 36CY provided by Owner.

APPENDIX D
TDU SYSTEM CAPACITY

RLC Technologies TDU System Capacity 30.0 MMBTU/HR

MMBTU/HR Required

	Tons per Hour																			
% Water	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
0%	0.692	1.383	2.075	2.767	3.458	4.150	4.842	5.533	6.225	6.917	7.608	8.300	8.992	9.683	10.375	11.067	11.758	12.450	13.142	13.833
5%	0.898	1.796	2.694	3.591	4.489	5.387	6.285	7.183	8.081	8.979	9.877	10.774	11.672	12.570	13.468	14.366	15.264	16.162	17.060	17.957
10%	1.104	2.208	3.312	4.416	5.520	6.624	7.729	8.833	9.937	11.041	12.145	13.249	14.353	15.457	16.561	17.665				
15%	1.310	2.621	3.931	5.241	6.551	7.862	9.172	10.482	11.792	13.103	14.413	15.723	17.034							
20%	1.516	3.033	4.549	6.066	7.582	9.099	10.615	12.132	13.648	15.165	16.681									
25%	1.723	3.445	5.168	6.891	8.613	10.336	12.059	13.781	15.504	17.227										
30%	1.929	3.858	5.787	7.716	9.644	11.573	13.502	15.431	17.360											
35%	2.135	4.270	6.405	8.540	10.675	12.811	14.946	17.081												
40%	2.341	4.683	7.024	9.365	11.706	14.048	16.389													
45%	2.547	5.095	7.642	10.190	12.737	15.285	17.832													
50%	2.754	5.507	8.261	11.015	13.769	16.522														
55%	2.960	5.920	8.880	11.840	14.800	17.759														
60%	3.166	6.332	9.498	12.664	15.831															
65%	3.372	6.745	10.117	13.489	16.862															
70%	3.579	7.157	10.736	14.314	17.893															
75%	3.785	7.569	11.354	15.139																
80%	3.991	7.982	11.973	15.964																
85%	4.197	8.394	12.591	16.788																
90%	4.403	8.807	13.210	17.613																
95%	4.610	9.219	13.829																	
100%	4.816	9.631	14.447																	

**** **MMBTU/HR required estimates above use 60% Thermal Transfer Efficiency and 900Deg F operating temperatures**

Message

From: Davies, Lynne [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=169EB6CBDEBB4CAF85F76390B8AB2674-LDAVIE12]
Sent: 4/7/2017 4:55:50 PM
To: Parker, Jennifer [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=d1421ff34d844008a9f09fdcf048ace6-Parker, Jennifer]
Subject: Memo: ChemWaste
Attachments: 17 02 27 Chem Waste Temp Authorization Questions.docx

FYI – this was the memo I sent to Lisa.

Lynne Davies
Attorney-Advisor
U.S. Environmental Protection Agency, Region 10
1200 Sixth Avenue, Suite 900, ORC -113
Seattle, WA 98101
(206) 553-5556

Message

From: Valdez, Heather [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=eb323347294d44009a369c3576798bdf-Valdez, Heather]
Sent: 5/31/2017 11:32:00 PM
To: Knittel, Janette [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=a955f914e8d34cb19b6f63ac60707d32-Knittel, Janette]
CC: Davies, Lynne [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=169eb6cbdebb4caf85f76390b8ab2674-LDavie12]
Subject: Attorney Client / Deliberative Process / Ex. 5
Attachments: TSD For HWC MACT V4 Compliance.pdf; HWC MACT Compliance Monitoring Requirements Guidance.pdf; EEE Performance Test Checklist.pdf; b3-cpt-cms-plans.pdf; c3-combining-riskburns-and-cpt.pdf

Attorney Client / Deliberative Process / Ex. 5

That is probably a lot to get started with.

Let me know if you have any questions

Heather Valdez
RCRA Project Manager, Chemical Engineer
RCRA Corrective Actions, Permits and PCBs Unit
Office of Air and Waste
EPA Region 10
1200 6th Ave, Suite 900, AWT-150, Seattle, WA 98101
(206) 553-6220
valdez.heather@epa.gov

From: Valdez, Heather
Sent: Wednesday, May 31, 2017 4:02 PM
To: Knittel, Janette <Knittel.Janette@epa.gov>
Cc: Davies, Lynne <Davies.Lynne@epa.gov>
Subject: RE: more examples?

Attorney Client / Deliberative Process / Ex. 5

Attorney Client / Deliberative Process / Ex. 5

Heather Valdez
RCRA Project Manager, Chemical Engineer
RCRA Corrective Actions, Permits and PCBs Unit
Office of Air and Waste
EPA Region 10
1200 6th Ave, Suite 900, AWT-150, Seattle, WA 98101
(206) 553-6220
valdez.heather@epa.gov

From: Knittel, Janette
Sent: Wednesday, May 31, 2017 3:26 PM
To: Valdez, Heather <Valdez.Heather@epa.gov>
Cc: Davies, Lynne <Davies.Lynne@epa.gov>
Subject: more examples?

Attorney Client / Deliberative Process / Ex. 5

Thanks,
Janette

Janette Knittel
U.S. EPA Region 10
Office of Air and Waste
RCRA Corrective Action, Permits, and PCB Unit
1200 6th Ave, Suite 900, OAW-150
Seattle, WA 98101-3140
206-553-0483
knittel.janette@epa.gov

Message

From: Knittel, Janette [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=a955f914e8d34cb19b6f63ac60707d32-Knittel, Janette]
Sent: 5/31/2017 10:25:54 PM
To: Valdez, Heather [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=eb323347294d44009a369c3576798bdf-Valdez, Heather]
CC: Davies, Lynne [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=169eb6cbdebb4caf85f76390b8ab2674-LDavie12]
Subject: more examples?

Attorney Client / Deliberative Process / Ex. 5

Thanks,
Janette

Janette Knittel
U.S. EPA Region 10
Office of Air and Waste
RCRA Corrective Action, Permits, and PCB Unit
1200 6th Ave, Suite 900, OAW-150
Seattle, WA 98101-3140
206-553-0483
knittel.janette@epa.gov

Message

From: Valdez, Heather [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=eb323347294d44009a369c3576798bdf-Valdez, Heather]
Sent: 4/4/2017 9:21:04 PM
To: Davies, Lynne [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=169eb6cbdebb4caf85f76390b8ab2674-LDavie12]; Knittel, Janette [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=a955f914e8d34cb19b6f63ac60707d32-Knittel, Janette]
Subject: My desorber w/afterburner applicability notes
Attachments: Thermal Treatment Applicability for Chem Waste lm.docx; final response to Oregon on ORU 2014.pdf

Here are my notes and the 2014 letter I found from Linda

Heather Valdez
RCRA Project Manager, Chemical Engineer
RCRA Corrective Actions, Permits and PCBs Unit
Office of Air and Waste
EPA Region 10
1200 6th Ave, Suite 900, AWT-150, Seattle, WA 98101
(206) 553-6220
valdez.heather@epa.gov

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 10
1200 Sixth Avenue, Suite 900
Seattle, WA 98101-3140

JAN 21 2014

OFFICE OF
AIR, WASTE AND TOXICS

Elizabeth Druback
Eastern Region Manager
Hazardous Waste Program
Oregon Department of Environmental Quality
400 E Scenic Dr., Sutie 2-307
The Dalles, OR 97058

Re: Chemical Waste Management of the Northwest (CWM)
Class 1* -Organics Recover Unit – Short Term Pilot Test
RCRA Permit ORD 089 452 353

Dear Ms. Druback:

The U.S. Environmental Protection Agency (EPA) has reviewed the class 1* permit modification request submitted to you by CWM. The enclosed comments outline our concerns with the permit modification classification, the designation of the unit, and technical issues with the pilot test plan .

Please contact me at (206) 553-6636 or by email at meyer.linda@epa.gov if you have any questions about these comments.

Sincerely,

Linda Meyer

Linda Meyer
EPA Project Manager

Enclosure

cc: Rich Duval, ODEQ

CHEMICAL WASTE MANAGEMENT OF THE NORTHWEST
MOBILE EVAPORATIVE DESORPTION UNIT
MODEL M01CR
PILOT TEST OPERATIONS PLAN
ARLINGTON, OREGON

Chemical Waste Management of the Northwest (CWMNW) has submitted a Class 1 RCRA Permit modification request for the addition of a temporary hazardous waste storage container to support a pilot test for operation of a mobile Evaporative Desorption Unit (EDU) as phase 1 of a proposed pilot test for a component separation technology known as an Organics Desorber and Recovery Unit. This component separation system and tank will operate for up to 90 days to demonstrate that this technology will "*yield the greatest environmental benefit*" by reclaiming organic products at higher efficiencies. As part of the Permit modification, CWMNW has submitted a pilot mobile EDU operations plan. The following comments summarize the review of the pilot mobile EDU operations plan and make recommendations for modifications and additions to the plan.

DOCUMENTS REVIEWED

- CWMNW Permit Modification Request Letter, dated 3 November 2013
- Mobile Evaporative Desorption Unit, Pilot Operations Test Plan, dated 5 November 2013
- Reterro Mobile EDU Piping and Instrumentation Diagram (P&ID)
- Intellishare Environmental FTO 100 System P&ID
- Reterro M01CR Typical Site Layout

COMMENTS ON THE PERMIT MODIFICATION TEST LETTER, BASIS FOR PERMIT MODIFICATION

1. CWMNW submitted a Class 1 RCRA Permit modification request to add a storage container for a 90-day pilot test of a small organic recovery unit referred to as the EDU. CWMNW states that based on the requirements of 40 CFR 270.42 Appendix I, Section F.1.c, the 55 gallon storage container is the only portion of the pilot test that requires regulatory oversight, because the proposed EDU will "'*yield the greatest environmental benefit*' by reclaiming organic products at higher efficiencies." It is unclear why this citation was selected as the basis for addition of a storage container. The permit modification request must justify why the pilot scale unit is not required to be included in the permit modification request. If CWMNW is using the exemption in 40 CFR 261.4(f), the EDU would only be exempt from permitting requirements for the duration of the 90-day pilot test. Once the final design for the EDU unit is selected, a Class 3 permit modification would be required to operate the treatment unit under the "miscellaneous unit" provisions at 40 C.F.R. 264.600 and the appropriate conditions for protection of human health and the environment from 40 C.F.R. Subparts I through O and AA through CC; Part 270; Part 63 Subpart EEE; and Part 146. In order to establish permit conditions for this unit, the information identified below must be collected during

the pilot scale test. CWMNW must revise the permit modification request to address these comments.

2. The regulatory citation in the request letter is incorrect. 40 CFR Part 270.42, Appendix I, F.1.C relies on 40 CFR 268.8 which is a reserved section of the land disposal regulations. Revise the permit modification request by citing the correct basis for the permit modification.

3. The permit modification request states that: "the proposed EDU will "'*yield the greatest environmental benefit'* by reclaiming organic products at higher efficiencies." The documents provided by CWMNW do not support this claim. Revise the permit modification request by providing a basis for and information to demonstrate that the EDU provides the greatest environmental benefit.

4. No documentation or test results were provided to certify the destruction and removal efficiency of the proposed EDU and associated Flameless Thermal Oxidizer (FTO) which is used to destroy the gases which are not condensed from the treatment unit. The documents provided do not indicate how the efficiency of the unit will be measured. Revise the documents to clarify what is meant by "reclaiming organic products at higher efficiencies" -- without clearly indicating if this refers to thermal efficiency, the efficiency of removing organics from the contaminated media, the destruction and removal efficiency of the FTO, or something else?

5. The documents reviewed do not explain if other environmental permits will be required nor describe the air emission standards for the EDU pilot test.

6. The attachment to the permit modification request cover letter labeled "Regulatory Review", states that the waste feed will be petroleum-contaminated soil, and that the effluent condensate will be only "oil/water". However, the Overview of the Pilot Test Operations Plan states that the test objective is to: "evaluate the feasibility of using Evaporative Desorption Technology (EDT) to treat ORU4 and **other organically contaminated wastes**"...and that the EDU was designed to treat "soil and other impacted media contaminated with petroleum and **other organics**." Since the facility treats a variety of contaminated soils containing petroleum hydrocarbons,nitroaromatic/nitramines, chlorinated pesticides, refinery waste feedstock, and other organic contaminated media containing water and a range of organics, the plan must be revised to discuss how the waste feed to the pilot test EDU will be representative of contaminants or waste streams that are expected to be treated during full-scale operation. The documents reviewed do not include any criteria for controlling waste feed rate or quality. If only petroleum contaminated soil will be treated during the pilot test, it is unclear how these data will be used to demonstrate that other organically contaminated wastes can be effectively treated by the EDU.

SPECIFIC COMMENTS ON THE PILOT OPERATIONS TEST PLAN

1. General. Nowhere in the document does it specify what the criteria are for determining that thermal treatment is complete. Specific criteria (for example, gas concentrations below a certain percent of the lower explosive level or after a certain treatment duration) must be included in the plan.

2. Section 1, states that the EDU will be operated at a temperature of less than 1100°F. No information on an operating temperature range is provided. The plan must be revised to include this information.

3. Section 1, states that effluent gases from the process chamber of the EDU are cooled, capturing organics from the vapor stream prior to treatment with an FTO. No information is provided regarding the operating conditions for the condenser or how the effectiveness of the condenser will be measured, evaluated, or controlled. The plan must be revised to include this information.

4. Section 1, states that the EDU FTO has a 99.5 percent efficiency. The basis for this rating, or how the actual effectiveness of the unit is determined, is not described in the document. Furthermore, Section 1.2.4 states a greater than 99 percent volatile organic compound destruction. If the destruction rate declines from 99.5 to 99.01 percent, the quantity of the VOC emissions would double. Vendor data, including specifications, cut sheets, and performance testing results, must be provided in the revised plan.

5. Section 1.1, notes that the EDU consists of the following components:
    - Air Process Heater and Blower
    - Process Chamber
    - Effluent Collection Heat Exchanger
    - Effluent Condensate Recovery Container
    - FTO

    The Pilot Test Operations Plan does not outline the operating parameters that will be monitored or recorded for each of these unit operations. The plan must be revised to include a list of gas flow rates, temperatures, pressures, and other criteria for each unit operation that can be used to evaluate and regulate the future operation and effectiveness of the system. Operating minimum and maximum values must be specified for each criterion.

6. Sections 1 and 2, include different maximum operating temperatures for the Process Chamber, including 1000°F and 1100°F. This discrepancy must be resolved.

7. Sections 1.2.2, 1.2.5.1, and 2, note that "oxidation reactions may be suppressed if desired by means of inert gas injection in the Process Chamber or effluent

manifold" and that "the effects of these reactions will be studied in the initial pilot phase." The plan does not discuss how the inert gases will be injected, under what conditions or constraints the injection will occur, or how the effects of the reactions will be studied. Revise the plan to include this information.

8. Section 1.2.3, states that "effluent from the Process Chamber is cooled by means of an air-to-air heat exchanger capable of cooling the process effluent to ≈125°F at the nominal operating conditions." The plan does not include any information explaining the reason for choosing 125°F as the target for the heat exchanger temperature. Additionally, it is not clear if any consideration was given to using a heat exchanger with more cooling capacity so that more of the effluent vapor could be condensed, which in turn would lower the organics feed rate to the FTO. The plan must be revised to include the justification for the operating conditions of each device and how the proposed conditions will maximize the effectiveness of the process.

9. Section 1.2.4, notes that the oxygen concentration in the FTO will be maintained at greater than 10 percent to ensure maximum destruction efficiency. No information is provided about how this parameter will be measured, monitored, or controlled or the basis for selecting this value. The plan must be revised to include this information.

10. Section 1.2.4. Although the plan includes a maximum FTO temperature of 1600°F, it is unclear if the FTO temperature will be increased by the combustion of the organics or if it will be controlled solely by the FTO internal heater. It is also unclear if there are any contingency plans or operating interlocks to prevent the combustion of organics from raising the FTO temperature above the maximum. Lastly, there is no discussion of a minimum necessary temperature to ensure unit performance (for example, the National Fire Protection Association auto-ignition temperature of 1400°F). The plan must be revised to include these details.

11. Section 1.2.4. If the FTO temperature is less than 1400°F, it is unclear how or if the gas flow into the FTO will be maintained below 20 percent LEL. No information is provided regarding LEL alarms or setpoints, how inert gas will be added to the system (automatically or manually), and how FTO oxygen content will be maintained above 10 percent. Oxygen level alarms or setpoints are also not described. The plan must be revised to include these details.

12. Section 2, notes that "the primary means of process monitoring is waste treatment box effluent temperature" and that "supplemental monitoring of the effluent constituents is provided using a commercial Combustible Gas Monitor and O_2 sensors." There is no discussion of the planned or desired operating temperature, the proposed combustible gas or oxygen limits, or the actions that will be taken should these ranges and limits be exceeded. The plan must be revised to include this information.

13. Section 2, notes that "desorption rates are controlled by controlling the temperature and flow rate of air input to the Process Chamber". The plan does not include details regarding the planned temperature and air flow rate limits or the actions that will be taken should these ranges and limits be exceeded. The plan must be revised to include this information.

14. Section 3.1.1, proposes to mix contaminated soil with clean soil to reach approximately 15 percent by weight hydrocarbon content.

    - The documents reviewed do not include sampling or analytical methods for measuring the hydrocarbon content of the soil.

    - The documents reviewed do not include any assumptions regarding the contamination level in the contaminated soil and the ratio of contaminated to clean soil needed in order to reach the 15 percent by weight contamination level. No information regarding how this contamination level will be verified is included.

    - The documents reviewed do not include an explanation of why 15 percent hydrocarbon content is considered optimal for pilot testing or why it would be representative of future operations.

    The plan must be revised to include this information.

15. Pilot Test Operations Plan, Section 3.1.5, references soil and effluent condensate testing procedures in the CWMNW Waste Analysis Plan (WAP). The WAP is simply a list of a large universe of sampling procedures and analytical procedures that may be used at the site. Specific sampling methods and analytical procedures must be referenced in the plan and an explanation demonstrating how the proposed data will demonstrate the efficacy of the system must be provided.

16. Pilot Test Operations Plan, Section 3.1.5, references soil and effluent condensate testing procedures. Comprehensive screening for individual contaminants of potential concern (COPCs) should be completed for both VOCs via Method 8260 and semivolatile organic compounds (SVOCs) via Method 8270. These data are necessary to demonstrate the efficacy of the system in removing the complete range of COPCs.

17. Section 3.3, notes that the following data will be recorded and maintained on each batch treatment process run.

    - Waste Soil Volume Treated
    - Waste Type Treated
    - Process Chamber Treatment Temperature
    - Effluent Temperature

- FTO Operating Exhaust Temperature
- FTO Total Gas Volume Destroyed
- Recovered Condensate Volume

No information is presented as to the frequency with which these data will be measured or recorded or that this information will be submitted to Oregon Department of Environmental Quality (ODEQ) for evaluation. The plan must be revised to include the frequency of sampling and include an outline of the information that will be submitted to ODEQ.

18. Section 3.3, in addition to the parameters listed in this section, the following data must be recorded and maintained for each batch treatment process run.

    - Carbon monoxide in the FTO exhaust
    - Hydrocarbon content of waste soil before and after treatment
    - Moisture content of the waste before treatment
    - Actual physical temperature of the waste soil during treatment
    - Duration of the thermal treatment at treatment temperature
    - Heat exchanger temperature (effluent condensate temperature at the exchanger discharge pipe)
    - Oxygen, VOC, and LEL measurements of effluent gas entering the FTO

19. Section 3.3. If this pilot test is being conducted pursuant to 40 CFR 261.4 (f) include all of the specific information identified in 40 CFR 261.4(f)(7) in the pilot test plan report.

20. Section 3.3, proposes the collection of at least one VOC sample from the FTO effluent for each batch. No information regarding the sampling procedure or analytical method is provided. The WAP does not reference any type of air sampling or analytical methods. Sampling and analytical methods must be specified and included in the plan.

21. Section 3.3, proposes the collection of at least one VOC sample from the FTO effluent for each batch. No information regarding target compounds or air emissions acceptance criteria are specified. This information must be specified and included in the plan.

22. Section 3.3, proposes the collection of at least one VOC sample from the FTO effluent. Comprehensive screening for individual COPCs must be completed for

both VOCs via Method 0030 and SVOCs via Method 0010 so that the efficacy of the system to treat the full range of anticipated COPCs can be evaluated.

23. Section 3.3, proposes the collection of at least one VOC sample from the FTO effluent. The facility treats a variety of contaminated soils containing petroleum hydrocarbons; nitroaromatic/nitramines; chlorinated pesticides; refinery waste feedstock; and other organic contaminated media containing water and a range of organics, from light, low boiling point solvents to high boiling point organics such as polycyclic aromatic hydrocarbons (PAHs), coal tars, No. 6 fuel, grease, and inert material. The plan must be revised to clearly indicate why sampling for other potential emission products such as dioxins/furans, chlorine/chloride, and nitrogen oxides is not proposed.

24. Section 3. It appears that the EDU will be located in Building B-2. No information is provided in the plan regarding building ventilation for the EDU emissions. The plan must be revised to include details regarding building ventilation and monitoring procedures (for example, carbon monoxide) in Building B-2.

PIPING AND INSTRUMENT DIAGRAMS

The Thermal Oxidizer P&ID does not contain sufficient detail. Add the level of detail used for the System P&ID to the Thermal Oxidizer P&ID.

The System P&ID has more detail, but the reference legend does not include all of the components. Furthermore, it appears that the sensor symbols in the drawing do not match the symbols on the legend. The legend must be revised to include a key for all components shown on the drawing and the drawing reviewed to ensure that the sensor symbols on the drawing match the symbols on the legend.

Message

From: Davies, Lynne [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=169EB6CBDEBB4CAF85F76390B8AB2674-LDAVIE12]
Sent: 4/5/2017 6:48:20 PM
To: Vergeront, Julie [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=99966bfa656f4d7c85b4b370f8b33c0e-Vergeront, Julie]
Subject: ORU-2 Design and Operations Plan
Attachments: SA 22 Draft Clean.docx

Hi Julie – this is the draft design and operations plan describing the organic recovery unit at ChemWaste's facility.

Attorney Client / Deliberative Process / Ex. 5

Lynne

Lynne Davies
Attorney-Advisor
U.S. Environmental Protection Agency, Region 10
1200 Sixth Avenue, Suite 900, ORC -113
Seattle, WA 98101
(206) 553-5556

State of Oregon
Department of Environmental Quality

Organic Recovery Unit #2
Design and Operations Plan

For

Chemical Waste Management of the Northwest, Inc.

Arlington Facility • ORD 089 452 353
17629 Cedar Springs Lane
Arlington, Oregon

Standalone Document No. 22

This document is issued by the
Oregon Department of Environmental Quality

TABLE OF CONTENTS

LIST OF APPENDICES

- ORGANIC RECOVERY UNIT #2

1.1 Introduction

This *Organic Recovery Unit #2 Design and Operations Plan* (Plan) establishes the design and operating standards for the Bioremediation and the Organic Recovery Unit (ORU) treatment processes.

1.2 Purpose

- To ensure compliance with all aspects of Organic waste treatment under 40 CFR §264 subparts AA,BB, and CC air emissions standards and;,
- To ensure treatment standards are achieved for all treated wastes per 40 CFR §268.40.

1.1.1 Organic Recovery Unit ORU-2

CWMNW operates two Organic Recovery Units (ORU), designated ORU-1 and ORU-2. Both ORU treatment systems are located adjacent to Containment Building B-5. ORU-1 received approval to operate in 2010 and has been operating since that time. ORU-1 is covered under *Standalone #19 – Bioremediation and Organic Recovery Unit Design and Operations Plan*.

ORU-2 was constructed and commissioned in 2016, The ORU-2 treatment unit treats listed and/or characteristic hazardous wastes using an indirect fired thermal process to reduce listed and/or characteristic hazardous wastes to the levels specified in 40 CFR Part 268. Secondary treatment methods may be required to reduce the treated listed and/or characteristic hazardous wastes to the levels specified in 40 CFR Part 268 prior to land disposal. Wastes accepted for treatment through the ORU-2 treatment system are staged inside Building B-5 and in approved containers in outside storage areas. Post-treatment solids awaiting LDR clearance or further treatment are temporarily stored in piles inside Building B-4 or B-5.

1.3 ORU-2 Treatment System

ORU-2 material handling conveyers receive material from two feed hoppers and convey the media to be treated to the ORU treatment unit. System feed conveyors are fully enclosed and ventilated to the thermal oxidizer. The ORU-2 system consists of a double pass rotary furnace that indirectly heats the media traveling through the inside of the rotary tube, and the treated media discharges at the feed end of the unit. System components subject to freezing are heat traced and insulated to prevent freezing. As-built design plans for the ORU-2 are contained in Appendix A.

1.4 Wastes Approved for Treatment

ORU-2 physically treat media with organic contamination. The following table illustrates the general waste families and possible associated RCRA Codes being treated by the system.

Table 19-1: ORU Approved Waste Codes

APPROVED EPA CODES
D001, D002, DOO3, D004, D005, D006, D007, D008, D009, D010, D011, D012, D013, D014, D015, D016, D017, D018, D019, D020, D021, D022, D023, D024, D025, D026, D027, D028, D029, D030, D031, D032, D033, D034, D035, DO36, D037, D038, D039, D040, F001, F002, F003, F005, F034, F037, F038, K001, K048, K049, K050, K051, K052, K143, K169, K170, K171, K172, P037, P059, P089, U002, U019, U031, U036, U051, U052, U060, U061, U112, U129, U140, U154, U159, U161, U165, U188, U210, U220, U228, U239

The ORU Treatment systems are made up of several subsystems that include the feed systems, an indirect fired Anaerobic Thermal Desorption Unit (ATDU), ash handling systems, vapor condensing system, process water handling and treatment systems, and air emissions control systems. A process flow diagram for the various systems is contained in Appendix B.

1.5 Waste Segregation

The treatment of the wastes with codes in Table 19-1 through the ORU system may require the isolation of process residuals dependent on the EPA codes associated with the waste being treated. These incompatible wastes will be treated separately following a system change over. The system changeover process shall include the following tasks, all wastes in the feed system will be processed through the ATDU, all process water will be evacuated from the system and treated through the process water treatment system, and all sludges accumulated in the sludge removal system will be removed and stored in accordance with the WAP. Evacuated residual sludges and process waters will be treated and/or managed in accordance with the WAP.

- ORU-2 SYSTEM OVERVIEW

2.1 Anaerobic Thermal Desorption Unit

The system is designed to separate the organic constituents from contaminated media in such a manner that they are preserved for collection and recycling. The Anaerobic Thermal Desorption Unit (ATDU) includes a rotating cylinder that is slightly inclined downward from the product feed end. This rotating cylinder is enclosed within an outer shell, within which heat is applied to the outside of the rotating cylinder. Either Landfill Gas or Propane will be used to fire the ATDU. Wastes inside the ATDU do not directly contact the heat source, and an inert atmosphere is maintained in the cylinder to prevent oxidation of the organic constituents. The indirectly heated cylinder vaporizes water and organics contained in the waste. The primary heat transfer mechanism is conduction through the cylinder wall.

2.2 ATDU Operating Conditions

The ATDU rotating cylinder operates under an inert anaerobic atmosphere, thereby preventing any oxidation or destruction of the hydrocarbon or chemical constituents. The inert anaerobic atmosphere is maintained during start-up and shutdown by purging the ATDU with steam to displace the oxygen. During normal operations, the water content of the feedstock is typically sufficient to generate enough water vapor to maintain the inert atmosphere inside the desorber and additional steam is therefore not required. The seals at the inlet and discharge ends of the rotary drum combined with the double tipping valve airlocks at either end maintain a non-oxidizing atmosphere in which the waste can be safely vaporized.

An oxygen sensor connected to the SCADA control system is installed in the discharge end of the ATDU continuously monitors the oxygen concentration within the rotary drum which during normal operations is typically below 1 percent. The SCADA control system the oxygen sensor measures the oxygen concentration inside the drum, in the event the oxygen level increases above 1 percent, steam can be added to reduce the oxygen concentration down to normal levels. In the event the oxygen level rises above 5 percent this would constitute a malfunction condition, the SCADA system will automatically shut down the burners and stop feed into the ATDU.

2.3 ATDU Shutdown Strategy

The system is shutdown employing three scenarios; these are Normal. Malfunction, and Emergency scenarios. The following is a discussion for each scenario;

2.3.1 Emergency Shutdown

Emergency shutdowns are required for

- Feed to the ATDU system is shutdown, feed conveyor system are shutdown
- Burners shutdown
- ATDU shutdown.
- Thermal Oxidizer bypass valve set to open
- Thermal Oxidizer is shutdown

2.3.2 Normal Plant Shutdown

The normal shutdown procedure involves shutting down equipment from the feed end of the unit down through the discharge equipment, allowing adequate time for each conveyor or piece of equipment to fully discharge before proceeding to the next item. The rotary drum will be allowed to cool before drum rotation is stopped. During this cooldown period steam is added to ensure the anaerobic atmosphere inside the ATDU is maintained. After the unit has cooled the vapor recovery and ancillary support systems are shut down. Finally, the thermal oxidizer system is shutdown

2.3.3 Shutdown due to Malfunction

The ATDU system is programmed with both software and hardwired process interlocks to ensure components shut down automatically upon the failure or malfunction of any critical piece of process equipment. Failure of the system to maintain proper combustion in the furnace, process conditions in the ATDU or thermal oxidizer, or a failure of the material handling equipment downstream of the ATDU will cause the system to automatically switch off the combustion system, stop the feed of material into the unit. Should the malfunction involve the thermal oxidize, the system, will divert process vapors away from the thermal oxidizer until the upset condition can be remedied.

2.3.4 Emergency Plant Shutdown

Hardwired interlocks will initiate an emergency shutdown upon loss of primary electrical power, high oxygen concentration inside the ATDU or a runaway stack temperature in the ATDU furnace or Thermal Oxidizer Unit. Redundant gas safety valves installed on each burner spring fail closed if there is any loss in the numerous permissive conditions or interlocks that allow their opening. Feed to the plant is stopped automatically. In certain cases, the thermal oxidizer will remain running but should the emergency condition involve the thermal oxidizer, the system will divert process vapors away from the thermal oxidizer until the upset condition can be remedied. An uninterruptible power supply (UPS) supports the control system to allow the operator to monitor the system shutdown in the event of complete power loss.

2.4 Feed Systems

A below grade mixing hopper south of contaminant Building B5 receives untreated medias, moisture conditions them if necessary and feeds the waste through a series of conveyors to the ATDU for thermal separation. If desired this mixing hopper feed system can also pile the moisture conditioned media inside Building B-5 allowing for storage of the media inside the building. A second feed hopper inside the building is loaded by mechanical methods, the hopper feeds a debris screen which removes materials meeting the definition of debris contained in 40 CFR 268.45 from the waste. Oversize media separated by the screening system is classified as debris and is stored on the floor in containment Building B-5 for delivery to other treatment methods in accordance with Standalone #11 - *Debris Treatment Plan*. The undersize media is then fed through a series of conveyors to the ATDU for thermal separation. An arrangement of airlocks ensure that oxygen is not able to enter the unit during the process operation. The ORU Feed Systems are designed to maintain compliance with 40 CFR 61, Subpart FF (Benzene Waste Operations NESHAP, or BWON) control and treatment standards to manage BWON subject materials when required.

2.5 Treated Ash Systems

The ORU vaporizes organic contaminants contained in media and produces a treated ash that is cooled through jacketed cooling conveyors. A series of transfer conveyors route the processed solids to several separate discharge points in Building B-4, each discharge point will be used to create piles inside the containment building approximately 250 tons in size. Ash may also be stored in containment Building B-5 or in approved containers prior to disposal or further treatment. The ash from the treatment process can be landfilled once the waste meets LDR limits in 40 CFR 268.7. Ash that does not meet the constituent specific LDRs is further treated and cleared before disposal. Confirmation testing is completed in accordance with Standalone #1- *Waste Analysis Plan*.

2.6 Vapor Recovery System

The organic vapors and water are gasified inside the rotating cylinder, and conveyed to a condensing system. The condensing system uses process water to quench the organic vapors. Once quenched the resulting quench water is separated into an organic fraction and a water fraction. The organic fraction separated from the treated wastes can be generally classified in two categories;

2.6.1 Petroleum Fractions

The condensed and separated organic fraction for wastes with recoverable petroleum fraction is not regulated according to 40 CFR 261.6(a)(3)(iv)(C), and is transferred to one of three product storage tanks in the tank farm area. Organic fraction product for these wastes is recycled as a commodity depending on makeup.

2.6.2 Non-Petroleum Fractions

The condensed organic fraction for wastes without recoverable petroleum fractions is subject to the disposal requirements contained in 40 CFR 268 and are managed in accordance with *Standalone #1 – Waste Analysis Plan*. The condensed organic fraction is transferred as process water to the water treatment system in the tank farm area.

2.7 Settled Solids

Settled solids which accumulate in the vapor recovery sump are conveyed out of the sump into a closed hopper. These accumulated solids may be reintroduced back into the ORU feed system for treatment using pumps or mechanical means. In some cases, a centrifuge may be used to dewater these solids for shipment offsite for additional treatment. Liquids separated in the centrifuging process are introduced back into the process water for reuse and/or final treatment.

2.8 Process Water System

Reclaimed commodities are separated from the process water fraction in the oil water separator. Process water is recycled back into the system, and any residual water condensed out of the incoming waste is stored in the process water tank. Residual process water is transferred to surge tanks in the tank farm area. Process water is treated through an onsite water treatment system in the tank farm area with sand and carbon filtration. Chemical treatment prior to filtration may be required for some waste streams. Treated process water meeting LDR

requirements may be reused for moisture conditioning of wastes in the solidification and stabilization process, or sent to the facilities solar evaporation ponds.

2.9 Air Emission Controls

Any residual non-condensable organic vapors are passed through a thermal oxidizer for complete destruction. The thermal oxidizer operation and performance is regulated by the facilities ACDP permit.

- ORU-2 SYSTEM TANKS

The following twenty-one (21) tanks are used in the ORU treatment system. Tank numbers listed below coincide with tank numbers provided on the flow diagram in Appendix B. All hazardous waste storage tanks associated with the ORU treatment system are managed in accordance with Standalone #8 – *Bulk Storage Plan*.

Table 22-3: ORU-2 Tank Listing

TANK #	DESCRIPTION	TYPE	CAPACITY (Gal)
RCRA Tanks			
F-1301	Interceptor	Above ground, horizontal, flat bottom, CS	3,000
F-1401	Oil Water Separator	Above ground, horizontal, cone bottom, CS	13,200
F-1402	Process Water Tank	Above ground, vertical, cone bottom, CS	20,000
F-1403	Process Water Mix Tank 1	Above ground, vertical, cone bottom, CS	20,000
F-1404	Process Water Mix Tank 2	Above ground, vertical, cone bottom, CS	20,000
F-1405	Treated Process Water Tank 1	Above ground, vertical, cone bottom, CS	20,000
F-1406	Treated Process Water Tank 2	Above ground, vertical, cone bottom, CS	20,000
F-1407	Treated Process Water Tank 3	Above ground, vertical, cone bottom, CS	20,000
F-1408	Treated Process Water Tank 4	Above ground, vertical, cone bottom, CS	20,000
F-1409	Treated Process Water Tank 5	Above ground, vertical, cone bottom, CS	20,000
F-1410	Treated Process Water Tank 6	Above ground, vertical, cone bottom, CS	20,000
F-1411	Treated Process Water Tank 7	Above ground, vertical, cone bottom, CS	20,000
F-1412	Treated Process Water Tank 8	Above ground, vertical, cone bottom, CS	20,000
F-1413	Treated Process Water Tank 9	Above ground, vertical, cone bottom, CS	20,000
F-1414	Treated Process Water Tank 10	Above ground, vertical, cone bottom, CS	20,000
F-1415	Treated Process Water Tank 11	Above ground, vertical, cone bottom, CS	20,000
F-1416	Treated Process Water Tank 12	Above ground, vertical, cone bottom, CS	20,000
ME-1101	Mix Hopper A	Above Ground Mix/Feed Hopper, CS	7,473
ME-1102	Feed Hopper B	Above Ground Feed Hopper	1,742
V-1401A	Sand Filter A	Above Ground Sand Filter A	100
V-1401B	Sand Filter B	Above Ground Sand Filter B	100
V-1402	Carbon Filter	Stainless Steel	3,950
Non-RCRA Tanks			
F-1417	Product Tank 1	Above ground, vertical, cone bottom, CS	20,000
F-1418	Product Tank 2	Above ground, vertical, cone bottom, CS	20,000
F-1419	Product Tank 3	Above ground, vertical, cone bottom, CS	20,000

- SYSTEM SECONDARY CONTAINMENT

The ORU-2 System containment is made up of 5 separate containment systems as listed below:

Table 22-4: ORU-2 System Containment

Site Plan Identifier	Area Description	Construction	Required Containment	Actual Containment
C	ORU System Equipment	Reinforced Concrete	3,739.3 ft^3	4,101.3 ft^3
B3	Product Tank Storage	Reinforced Concrete	2,948.6 ft^3	3,152.5 ft^3
B2	Process Water Treatment Area	Reinforced Concrete	2,932.1 ft^3	3,502.5 ft^3
B1	Treated Water Storage	Reinforced Concrete	3,433.3 ft^3	6,265.2 ft^3
D	Mixing Hopper Vault	Reinforced Concrete	1,018.4 ft^3	9,781.3 ft^3
A	Truck Offload Area	Reinforced Concrete	120 ft^3	159.8 ft^3

All ORU-2 containment areas are designed to meet the requirements contained in 40 CFR §264.193. 40 CFR §264.193(e)(2) requires that the secondary containment areas be large enough to contain the capacity of the largest tank plus precipitation from a 25-year, 24-hour storm, (refer to Appendix C for containment calculations). All joints in containment slabs are constructed with chemical-resistant waterstops meeting the requirements of 40 CFR §264.193(e)(2)(iii)). The slab is coated with a chemically compatible impermeable coating meeting the requirements of 40 CFR §264.193(e)(2)(iv)). Stormwater collected from the sumps in these containment areas will be pumped to the process water system and ultimately treated through the process water treatment system. The P.E. certification of the containment structures and tanks required by 40 CFR 264.192(b) will be maintained at the facility in the operating record.

- ORU-2 OPERATIONS

5.1 Organic Recovery Unit Contaminated Waste Handling

Following arrival and acceptance of the waste, the wastes are either stored in approved storage areas or fed directly into the treatment system through two feed hoppers in the system.

5.2 Subpart CC Waste Handling

Wastes subject to Subpart CC Level 1 controls will be stored or accepted in roll-off boxes and dump type vehicles may be placed on the slab floor in Containment Building B-5. Wastes subject to Subpart CC Level 2 controls will remain in the Level 2 shipping containers in accordance with Standalone # 9 - *Container Storage Design and Operations Plan* until they are transferred to the ORU-2 outside mixing feed hopper and amended with drying agents as necessary. Wastes with higher moisture contents may also be mixed with dryer materials in the mixing feed hopper or inside Building B-5 to attain appropriated moisture content.

5.3 Subpart FF Waste Handling

CWMNW tracks the facility's Total Annual Benzene (TAB) and it has historically been less than 1 Mg; therefore, CWMNW is not subject to controls in Subpart FF. However, in the event that generators require their specific wastes to be managed under controls, wastes subject to 40 CFR 61, Subpart FF may be handled in controlled containers such as roll off boxes until the material is transferred into the ORU-2 mixing feed hopper. These wastes will be maintained in containers that meet BWON control requirements, and shall be inspected and monitored in order to comply with all related standards. The vapors throughout the ORU feed system are routed through closed-vent systems to control devices, and all the equipment and piping lines are subject to BWON inspection and monitoring requirements.

5.4 Waste Preparation for Organic Recovery

In general, waste preparation improves the ability of the ORU-2 to treat the contaminated waste. This preparation includes specific operations for screen sizing and size reduction that are also dependent on the uniformity, moisture, and liquid content of the incoming contaminated waste.

Screening (vibrating or non-vibrating) is a primary operation, and wastes are screened or strained to remove debris. Blending low and high concentration waste or high and low boiling point wastes optimizes the operation and reduces problems in liquids recovery.

5.5 Organic Recovery Unit Treatment Capacity ORU-2

The indirect-fired ATDU has an ultimate design capacity of 30 million British thermal units (30 MMBtu), and a theoretical heat transfer efficiency of 60-percent. The temperature capacity of the system is 1,200°F. The actual operating temperatures vary depending upon the boiling points of the organic constituents being extracted such that optimal fuel consumption is maintained.

The theoretical treatment capacity of the system (tons/hour) depends primarily upon the moisture content of the waste and the thermal capacity of the ATDU. Appendix D provides the estimated treatment capacity of the system running at 900° F, based upon the moisture content of incoming waste, and using a thermal transfer efficiency of 60-percent.

- ORU-2 REGULATORY STANDARDS

6.1 Organic Recovery Unit - 40 CFR Part 264 Subparts J/X Compliance

6.1.1 40 CFR Part 264, Subpart J Compliance

The ORU contains process water tanks that store and/or treat hazardous waste and are subject to 40 CFR Part 264, Subpart J. These tanks are managed in compliance with Standalone #8 - *Bulk Storage Plan*, which contains requirements for inspection and operation of these tanks. The hazardous waste storage tank systems in both of the ORU systems have been adequately designed, have sufficient structural integrity, and are acceptable for storing hazardous waste. Required engineer's certifications are contained in Standalone #8 - *Bulk Storage Plan*. Further, the tanks are provided with sufficient secondary containment meeting the requirements of 40 CFR 264.193. Containment calculations for the system are shown in Appendix C. All tanks associated with the ORU are included in Standalone #8 - *Bulk Storage Plan*, which includes all permitted RCRA tanks at the facility.

In the event of any leak or spill from a tank system or secondary containment system, the facility shall comply with response requirements per 40 CFR 264.196. Closure and post-closure care of the hazardous waste tank systems are discussed in Standalone #5 – *Closure/Post-Closure Plan*.

6.1.2 40 CFR Part 264, Subpart X Compliance

The ORU-2 treatment system contains a thermal desorption unit (TDU) and shaker screen equipment that is subject to 40 CFR Part 264, Subpart X. These miscellaneous units are most similar to tank systems; and thus, the applicable and appropriate provisions of 40 CFR Part 264, Subpart J shall be complied with to ensure protection of human health and the environment. Standalone #23 – Subpart X units includes these pieces of equipment.

6.2 Routine Tank Inspections

The elements and frequency of routine inspections of ORU-2 systems hazardous waste tanks, piping and containment are included in Standalone #3 - *Inspection Plan*. The tanks and piping shall be inspected for visible leaks and general condition. The overfill alarm systems shall be tested to insure they are in working order. The containment area and sumps shall be inspected for evidence of any liquid collection and evidence of any leakage from the associated pipes, pumps, tanks and equipment contained within the area. An inspection form for both the ORU systems tanks, piping and containment is contained in Standalone #3 - *Inspection Plan*.

6.3 RCRA Subparts AA, BB and CC and Benzene NESHAPS - Applicability and Compliance for Organic Recovery Systems

6.3.1 40 CFR Part 264, Subpart AA Applicability

40 CFR Part 264, Subpart AA defines the air emission standards for process vents associated with distillation, fractionation, thin-film evaporation, solvent extraction, or air or steam stripping operations. ORU-2 does not contain any distillation, fractionation, thin-film evaporation, solvent

extraction, or air or steam streaming operation; and thus, 40 CFR Part 264, Subpart AA does not apply to either ORU Treatment system and subsystems.

6.3.2 40 CFR Part 264, Subpart BB Applicability and Compliance

ORU-2 systems are subject to the requirements of 40 CFR Part 270; and thus, all equipment that contains or contacts hazardous waste with organic concentrations of at least 10 percent by weight is subject to 40 CFR Part 264, Subpart BB. Compliance requirements for 40 CFR Part 264, Subpart BB is discussed in the Organic Recovery Unit Controls and Monitoring section below

6.3.3 40 CFR Part 264, Subpart CC Applicability

The requirements of 40 CFR Part 264, Subpart CC apply to owners and operators of all facilities that treat, store, or dispose of hazardous waste in tanks, surface impoundments, or containers subject to 40 CFR Part 264, Subparts I, J, or K. As discussed in Section 3.6.1, the ORU does contain hazardous waste storage tanks subject to 40 CFR Part 264, Subpart J; however, per 40 CFR 264.1080(b)(7), the requirements of 40 CFR Part 264, Subpart CC do not apply to a hazardous waste management unit that the owner or operator certifies is equipped with and operating air emission controls in accordance with the requirements of an applicable Clean Air Act regulation codified under 40 CFR Part 60, Part 61, or Part 63. All hazardous waste storage tanks in the ORU are equipped with and operate with air emission controls in accordance with 40 CFR Part 61, Subpart FF; and thus, the hazardous waste storage tanks in the ORU are not subject to 40 CFR Part 264, Subpart CC. All 40 CFR Part 264, Subpart CC requirements, if any, are contained in the facilities ACDP Permit.

Subpart CC regulations are applicable to containers which are not handled in accordance with 40 CFR Part 61, Subpart FF, having a design capacity greater than 0.1 m^3 (approximately 26 gallons), and containing hazardous waste that has an average volatile organic (VO) concentration greater than 500 ppm by weight (ppmw) at the point of waste generation. Waste received at the facility for ORU treatment will typically arrive or be placed in containers that are larger than the exempted capacity and may contain hazardous waste with VO concentrations greater than 500 ppmw. CWMNW complies with Subpart CC container standards as provided in the Permit and Standalone # 9 - *Container Storage Design and Operations Plan*. In addition, the waste in any container is unloaded in an expedient manner to minimize potential organic air emissions. If, for any reason, unloading of the contaminated waste does not commence immediately, the container is to be kept covered with a lid that meets Subpart CC Level 1 controls. The lid or cover forms a continuous barrier over the entire surface area with no visible cracks, holes, gaps or other open spaces.

6.3.4 40 CFR Part 61, Subpart FF Applicability and Compliance

The ORU at certain times is subject to 40 CFR Part 61, Subpart FF (BWON), since it is part of a facility that intermittently treats, stores, and disposes of BWON wastes from chemical plants and petroleum refineries where the regulation does apply. CWMNW tracks the facility's Total Annual Benzene (TAB), and has historically been less than 1 Mg. Therefore, CWMNW facility is not subject to controls in Subpart FF. However, should the generator require their specific wastes be managed under controls, wastes subject to 40 CFR 61, Subpart FF may be handled in controlled containers such as roll off boxes until the material is loaded into the mixing feed hopper. These wastes shall be maintained in containers that meet BWON control requirements,

and shall be inspected and monitored as to comply with all related standards. The vapors throughout the ORU-2 feed system are routed through closed-vent systems to control devices, and all the equipment and piping lines are subject to BWON inspection and monitoring requirements.

All fixed-roof tanks shall have no detectable emissions in accordance with Method 21 standards and must be closed and sealed unless it is opened for sampling, inspections, maintenance, repair or removal of the waste. All organic vapors that are vented shall be maintained in a closed-vent system that routes to the thermal oxidizer control device.

In instances where the tank is venting to the atmosphere by a pressure relief device, these devices must remain in closed, sealed positions during normal operations. They may be opened if it is necessary to prevent damage or permanent disfiguration to tank, during filling or emptying, or during malfunctions. This follows the alternative standard for tanks under 40 CFR 61.351, allowing tanks handling primarily organic material to have only a pressure relief device.

The oil water separator in the ORU system is vented to the closed vent system and to the thermal oxidizer control device.

- ORU-2 CONTROLS AND MONITORING

The entire ORU-2 unit is centrally-monitored and controlled using a SCADA control package. The computer-based process controls provide graphic screens for effective plant control, monitoring, and data storage. The ORU-2 SCADA control system allow real-time access to all key plant parameters, and records the required operating parameters for compliance with the Part B permit and the ACDP permit. The demonstrated compliance SCADA system records the following parameters:

- Monitoring point CP1 - TDU Flue gas temperature - Deg F
- Monitoring point CP2 - TDU Syngas temperature - Deg F
- Monitoring point CP3 – TDU Infeed rate - TPH
- Monitoring point CP4 - Thermal oxidizer chamber temperature - Deg F
- Monitoring Point CP5 - Thermal oxidizer feed valve position – Open/Closed

The SCADA process controls enable the operator to improve system capacity, optimize fuel consumption, and protect the system against accidental malfunctions. The computerized system includes automatic fail safes for controlled shutdown of the system during upsets.

The process instrumentation and electrical switch gear is housed in a motor control center. The SCADA control system and operators control station is located in the control room south of the thermal processing system. Plant operators are trained in the operational and maintenance aspects of the system and these requirements are contained in Standalone #2 - *Security Procedures, Hazard Prevention, and Training Plan.*

7.1 Control Device Monitoring

The emissions control devices throughout the ORU system require monitoring of several different parameters, and the requirements for these are established in the facilities ACDP permit. The facility shall manage leaks identified by regular inspections in compliance with the requirements in 40 CFR Part 264.1064.

7.2 Tank Monitoring

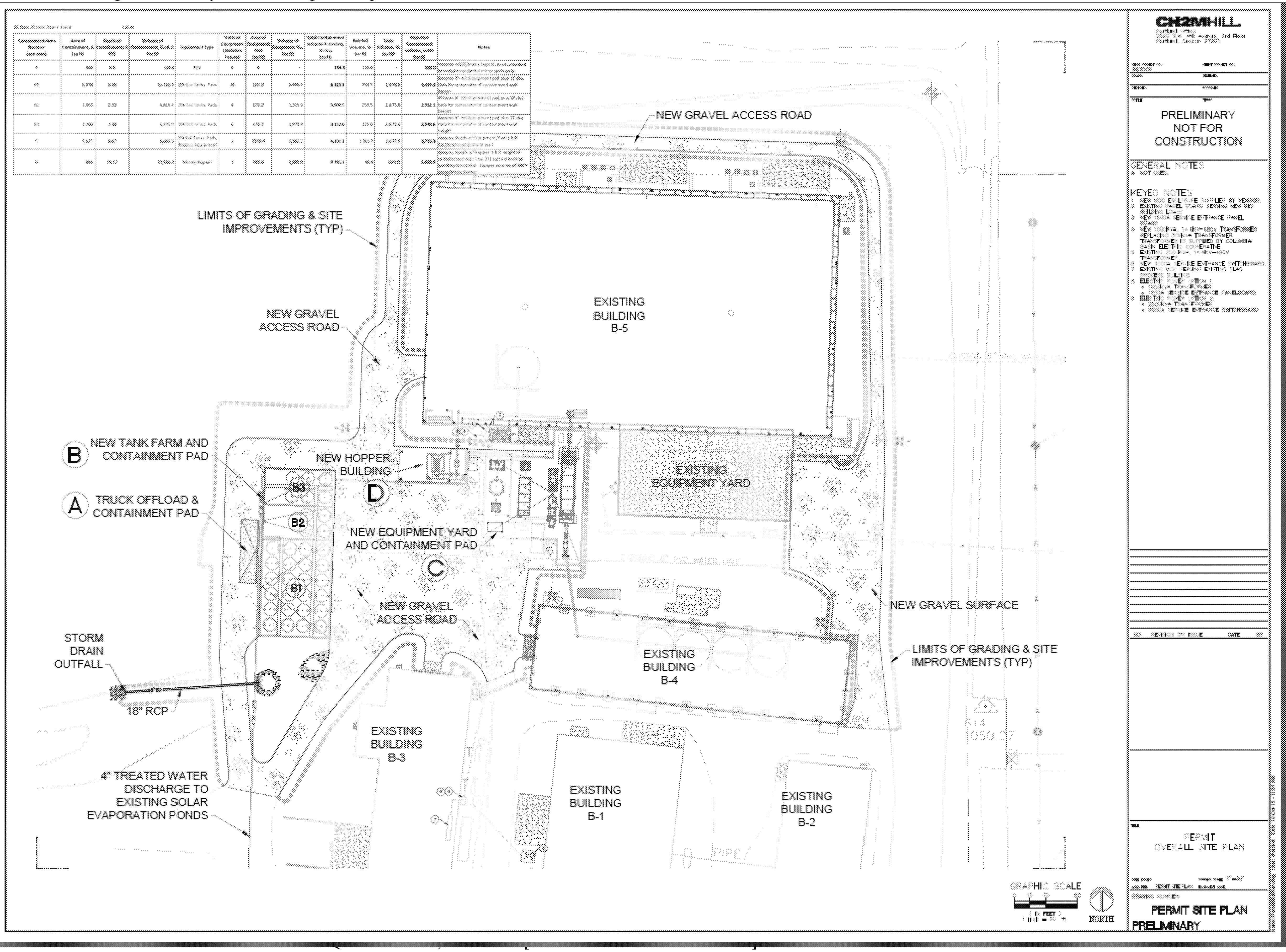
As indicated in Section 3.6.3, all hazardous waste storage tanks in the ORU-2 system are equipped with and operate with air emission controls in accordance with 40 CFR Part 61, Subpart FF; and thus, the hazardous waste storage tanks in the ORU-2 system are not subject to 40 CFR Part 264, Subpart CC. The facility shall comply with all applicable requirements under 40 CFR Part 61, Subpart FF. All hazardous waste tanks are equipped with a fixed roof cover and shall be visually inspected by the owner and operator quarterly, and monitored via Method 21 annually. If leaks are detected, responses and recordkeeping shall be made in compliance with 40 CFR Part 264, Subpart BB and 40 CFR 264.1064.

7.3 Other Equipment Monitoring

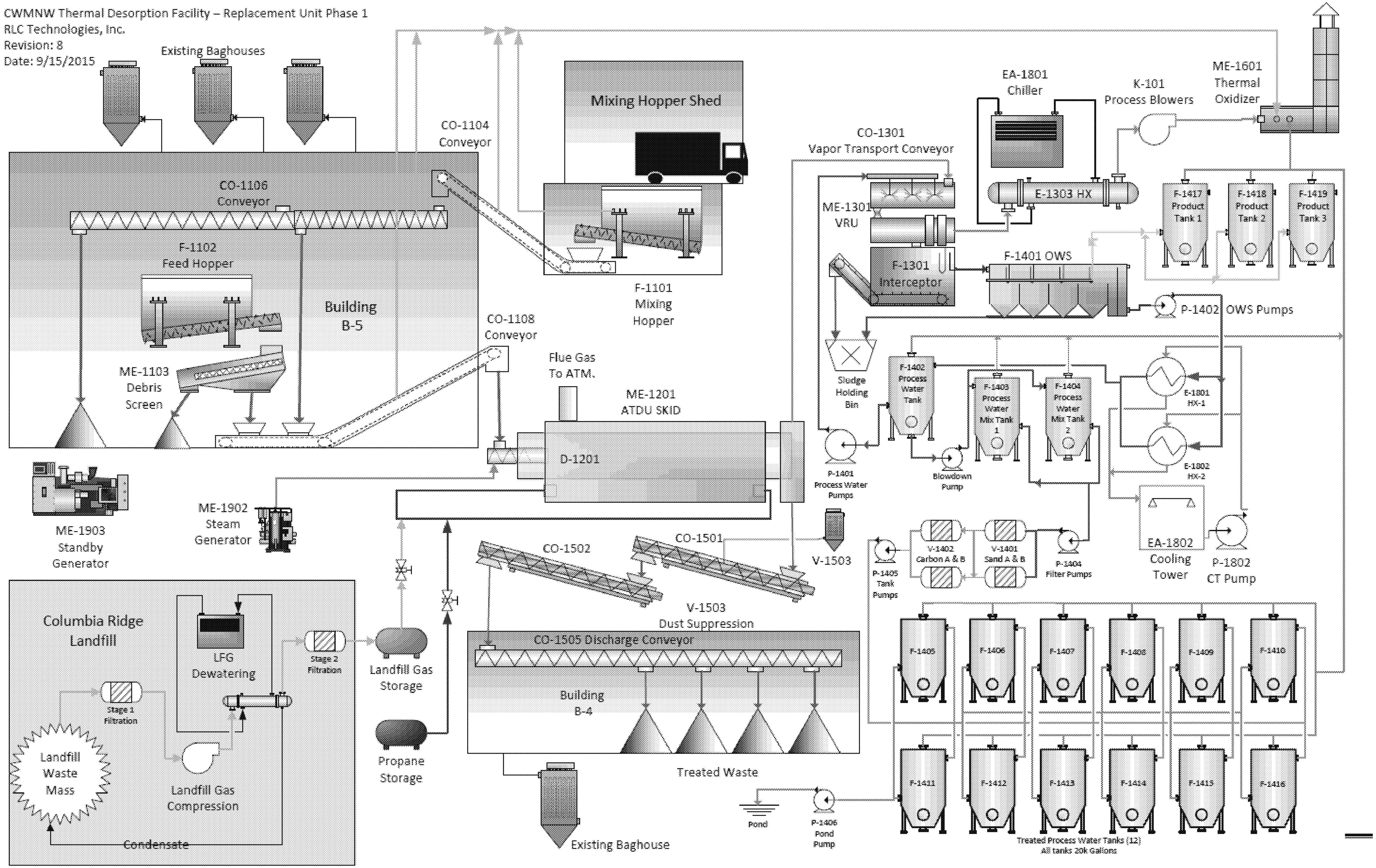
The ORU-2 is in heavy liquid service, and all pumps, valves, and pressure relief devices shall be observed for potential leaks using the following methods: Audible, Visual, and Olfactory (AVO), per 40 CFR Part 264, Subpart BB. There is no stated monitoring frequency for equipment in heavy liquid service according to 40 CFR Part 264, Subpart BB; however, monitoring shall be conducted quarterly consistent with industry best management practices, and to satisfy the BWON quarterly visual inspection requirements. When a leak is discovered, 40 CFR Part 60, Method 21 shall be used to measure the severity.

All sampling stations within ORU-2 system shall be built and kept up to design and installation requirements in order to stay compliant with 40 CFR, Subpart BB. All operational open-ended lines or pipes shall have a cap, plug, or double valve system when not in use.

APPENDIX A
AS-BUILT DESIGN PLANS FOR ORU-2


CH2MHILL
PRELIMINARY
NOT FOR
CONSTRUCTION
GENERAL NOTES
KEYED NOTES
NEW GRAVEL ACCESS ROAD
LIMITS OF GRADING & SITE
IMPROVEMENTS (TYP)
NEW GRAVEL
ACCESS ROAD
EXISTING
BUILDING
B-5
B
NEW TANK FARM AND
CONTAINMENT PAD
NEW HOPPER
BUILDING
D
A
TRUCK OFFLOAD &
CONTAINMENT PAD
B3
B2
B1
EXISTING
EQUIPMENT YARD
NEW EQUIPMENT YARD
AND CONTAINMENT PAD
C
NEW GRAVEL
ACCESS ROAD
NEW GRAVEL SURFACE
STORM
DRAIN
OUTFALL
18" RCP
EXISTING
BUILDING
B-4
LIMITS OF GRADING & SITE
IMPROVEMENTS (TYP)
EXISTING
BUILDING
B-3
4" TREATED WATER
DISCHARGE TO
EXISTING SOLAR
EVAPORATION PONDS
EXISTING
BUILDING
B-1
EXISTING
BUILDING
B-2
GRAPHIC SCALE
NORTH
PERMIT
OVERALL SITE PLAN
PERMIT SITE PLAN
PRELIMINARY

APPENDIX B
PROCESS FLOW DIAGRAM


CWMNW Thermal Desorption Facility – Replacement Unit Phase 1
RLC Technologies, Inc.
Revision: 8
Date: 9/15/2015
Existing Baghouses
Mixing Hopper Shed
CO-1104 Conveyor
CO-1106 Conveyor
F-1102 Feed Hopper
Building B-5
ME-1103 Debris Screen
CO-1108 Conveyor
F-1101 Mixing Hopper
Flue Gas To ATM.
ME-1201 ATDU SKID
D-1201
ME-1903 Standby Generator
ME-1902 Steam Generator
CO-1301 Vapor Transport Conveyor
ME-1301 VRU
F-1301 Interceptor
EA-1801 Chiller
E-1303 HX
K-101 Process Blowers
ME-1601 Thermal Oxidizer
F-1417 Product Tank 1
F-1418 Product Tank 2
F-1419 Product Tank 3
F-1401 OWS
P-1402 OWS Pumps
Sludge Holding Bin
F-1402 Process Water Tank
F-1403 Process Water Mix Tank 1
F-1404 Process Water Mix Tank 2
E-1801 HX-1
E-1802 HX-2
P-1401 Process Water Pumps
Blowdown Pump
EA-1802 Cooling Tower
P-1802 CT Pump
V-1503
CO-1502
CO-1501
V-1402 Carbon A & B
V-1401 Sand A & B
P-1404 Filter Pumps
P-1405 Tank Pumps
V-1503 Dust Suppression
CO-1505 Discharge Conveyor
Building B-4
Treated Waste
Existing Baghouse
Columbia Ridge Landfill
LFG Dewatering
Stage 1 Filtration
Stage 2 Filtration
Landfill Waste Mass
Landfill Gas Compression
Condensate
Landfill Gas Storage
Propane Storage
Pond
P-1406 Pond Pump
F-1405
F-1406
F-1407
F-1408
F-1409
F-1410
F-1411
F-1412
F-1413
F-1414
F-1415
F-1416
Treated Process Water Tanks (12)
All tanks 20k Gallons

APPENDIX C
SECONDARY CONTAINMENT CALCULATIONS

25 Year, 25 Hour Storm Event *1.5 in*

Containment Area Number (see plan)	Area of Containment, A (sq ft)	Depth of Containment, d (ft)	Volume of Containment, V_c=A.d (cu ft)	Equipment Type	Units of Equipment (Includes Future)	Area of Equipment Pad (sq ft)	Volume of Equipment, V_{eq} (cu ft)	Total Containment Volume Provided, V_c-V_{eq} (cu ft)	Rainfall Volume, V_r (cu ft)	Tank Volume, V_t (cu ft)	Required Containment Volume, V_r+V_t (cu ft)	Notes
A	960	0.5	159.8	N/A	0	0	-	159.8	120.0	-	120.0	Volume = 1/3(Area x Depth). Area provided to contain incidental minor spills only.
B1	6,078	2.33	14,160.8	20k Gal Tanks, Pads	24	172.2	7,895.5	6,265.2	759.7	2,673.6	3,433.3	Assume 6"-tall Equipment pad plus 12' dia. tank for remainder of containment wall height
B2	2,068	2.33	4,818.4	20k Gal Tanks, Pads	4	172.2	1,315.9	3,502.5	258.5	2,673.6	2,932.1	Assume 6"-tall Equipment pad plus 12' dia. tank for remainder of containment wall height
B3	2,200	2.33	5,125.9	20k Gal Tanks, Pads	3	172.2	1,973.9	3,152.0	275.0	2,673.6	2,948.6	Assume 6"-tall Equipment pad plus 12' dia. tank for remainder of containment wall height
C	8,525	0.67	5,683.5	20k Gal Tanks, Pads, Process Equipment	1	2373.4	1,582.2	4,101.3	1,065.7	2,673.6	3,739.3	Assume depth of Equipment/Pad is full height of containment wall
D	894	14.17	12,666.3	Mixing Hopper	1	203.6	2,885.0	9,781.3	46.4	972.0	1,018.4	Assume height of hopper is full height of containment wall. Use 371 sqft exterior to building for rainfall. Hopper volume of 36CY provided by Owner.

APPENDIX D
TDU SYSTEM CAPACITY

RLC Technologies TDU System Capacity 30.0 MMBTU/HR

MMBTU/HR Required

	Tons per Hour																			
% Water	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
0%	0.692	1.383	2.075	2.767	3.458	4.150	4.842	5.533	6.225	6.917	7.608	8.300	8.992	9.683	10.375	11.067	11.758	12.450	13.142	13.833
5%	0.898	1.796	2.694	3.591	4.489	5.387	6.285	7.183	8.081	8.979	9.877	10.774	11.672	12.570	13.468	14.366	15.264	16.162	17.060	17.957
10%	1.104	2.208	3.312	4.416	5.520	6.624	7.729	8.833	9.937	11.041	12.145	13.249	14.353	15.457	16.561	17.665				
15%	1.310	2.621	3.931	5.241	6.551	7.862	9.172	10.482	11.792	13.103	14.413	15.723	17.034							
20%	1.516	3.033	4.549	6.066	7.582	9.099	10.615	12.132	13.648	15.165	16.681									
25%	1.723	3.445	5.168	6.891	8.613	10.336	12.059	13.781	15.504	17.227										
30%	1.929	3.858	5.787	7.716	9.644	11.573	13.502	15.431	17.360											
35%	2.135	4.270	6.405	8.540	10.675	12.811	14.946	17.081												
40%	2.341	4.683	7.024	9.365	11.706	14.048	16.389													
45%	2.547	5.095	7.642	10.190	12.737	15.285	17.832													
50%	2.754	5.507	8.261	11.015	13.769	16.522														
55%	2.960	5.920	8.880	11.840	14.800	17.759														
60%	3.166	6.332	9.498	12.664	15.831															
65%	3.372	6.745	10.117	13.489	16.862															
70%	3.579	7.157	10.736	14.314	17.893															
75%	3.785	7.569	11.354	15.139																
80%	3.991	7.982	11.973	15.964																
85%	4.197	8.394	12.591	16.788																
90%	4.403	8.807	13.210	17.613																
95%	4.610	9.219	13.829																	
100%	4.816	9.631	14.447																	

****** MMBTU/HR required estimates above use 60% Thermal Transfer Efficiency and 900Deg F operating temperatures**

Message

From: Davies, Lynne [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=169EB6CBDEBB4CAF85F76390B8AB2674-LDAVIE12]
Sent: 5/15/2017 4:28:06 PM
To: Galbraith, Michael [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=0abf7f5c1a5e462e8096cb58ef9757eb-MGALBRAI]
Subject: Question re: Sharepoint Access to ChemWaste Permit

Hi Mike!
Thanks so much for all of the files you've sent – we are combing through them. Is it possible to add a contact from Oregon to the Sharepoint site you gave us access to with the ChemWaste permit? He would really benefit from seeing this example, but I didn't know if we could add state folks to the EPA sharepoint site.

Thanks!
Lynne

Lynne Davies
Attorney-Advisor
U.S. Environmental Protection Agency, Region 10
1200 Sixth Avenue, Suite 900, ORC -113
Seattle, WA 98101
(206) 553-5556

Message

From: Davies, Lynne [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=169EB6CBDEBB4CAF85F76390B8AB2674-LDAVIE12]
Sent: 5/19/2017 6:53:16 PM
To: Galbraith, Michael [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=0abf7f5c1a5e462e8096cb58ef9757eb-MGALBRAI]
CC: Knittel, Janette [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=a955f914e8d34cb19b6f63ac60707d32-Knittel, Janette]
Subject: Quick Check-in

Hi Mike – We hope you're well and almost off for the weekend! I'm going to send an invite for a short call just so we can

Attorney Client / Deliberative Process / Ex. 5

Many thanks, as always, for your help.

Best,
Lynne

Lynne Davies
Attorney-Advisor
U.S. Environmental Protection Agency, Region 10
1200 Sixth Avenue, Suite 900, ORC -113
Seattle, WA 98101
(206) 553-5556

Message

From: Valdez, Heather [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=eb323347294d44009a369c3576798bdf-Valdez, Heather]
Sent: 3/30/2017 1:39:46 AM
To: Knittel, Janette [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=a955f914e8d34cb19b6f63ac60707d32-Knittel, Janette]; Davies, Lynne [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=169eb6cbdebb4caf85f76390b8ab2674-LDavie12]; McArthur, Lisa [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=524660efbdb140e7868646d8073f0c72-McArthur, Lisa]
Subject: RE: Air and RCRA Relationship - Internal Deliberative

Attorney Client / Deliberative Process / Ex. 5

Heather Valdez
RCRA Project Manager, Chemical Engineer
RCRA Corrective Actions, Permits and PCBs Unit
Office of Air and Waste
EPA Region 10
1200 6th Ave, Suite 900, AWT-150, Seattle, WA 98101
(206) 553-6220
valdez.heather@epa.gov

From: Knittel, Janette
Sent: Wednesday, March 29, 2017 5:05 PM
To: Valdez, Heather <Valdez.Heather@epa.gov>; Davies, Lynne <Davies.Lynne@epa.gov>; McArthur, Lisa

<McArthur.Lisa@epa.gov>
Subject: RE: Air and RCRA Relationship - Internal Deliberative

Heather,

Attorney Client / Deliberative Process / Ex. 5

Janette

From: Valdez, Heather
Sent: Monday, March 27, 2017 12:50 PM
To: Tim Oliver <Timothy.Oliver@akana.us>; Davies, Lynne <Davies.Lynne@epa.gov>; Knittel, Janette <Knittel.Janette@epa.gov>
Subject: RE: Air and RCRA Relationship - Internal Deliberative

Attorney Client / Deliberative Process / Ex. 5

Lynne, Tim, am I missing something? Can you guess as to why this was not straight forward and clear when it was first permitted?

Heather Valdez
RCRA Project Manager, Chemical Engineer
RCRA Corrective Actions, Permits and PCBs Unit
Office of Air and Waste
EPA Region 10
1200 6th Ave, Suite 900, AWT-150, Seattle, WA 98101
(206) 553-6220
valdez.heather@epa.gov

From: Tim Oliver [mailto:Timothy.Oliver@akana.us]
Sent: Monday, March 27, 2017 10:40 AM
To: Valdez, Heather <Valdez.Heather@epa.gov>
Subject: RE: Air and RCRA Relationship - Internal Deliberative

Nonresponsive Discussion of Personal Matters / Ex. 6 so it will probably next Monday/Tuesday before I can really get in to this and give you a proper response.

From: Valdez, Heather [mailto:Valdez.Heather@epa.gov]
Sent: Thursday, March 23, 2017 1:51 PM
To: Davies, Lynne; Tim Oliver; Obbink, Elizabeth [USA]
Cc: Knittel, Janette
Subject: Air and RCRA Relationship - Internal Deliberative

Internal Deliberative

Attorney Client / Deliberative Process / Ex. 5

Attorney Client / Deliberative Process / Ex. 5

Attorney Client / Deliberative Process / Ex. 5

Eager to hear others thoughts about this.

Heather Valdez

RCRA Project Manager, Chemical Engineer
RCRA Corrective Actions, Permits and PCBs Unit
Office of Air and Waste
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1200 6th Ave, Suite 900, AWT-150, Seattle, WA 98101
(206) 553-6220
valdez.heather@epa.gov
